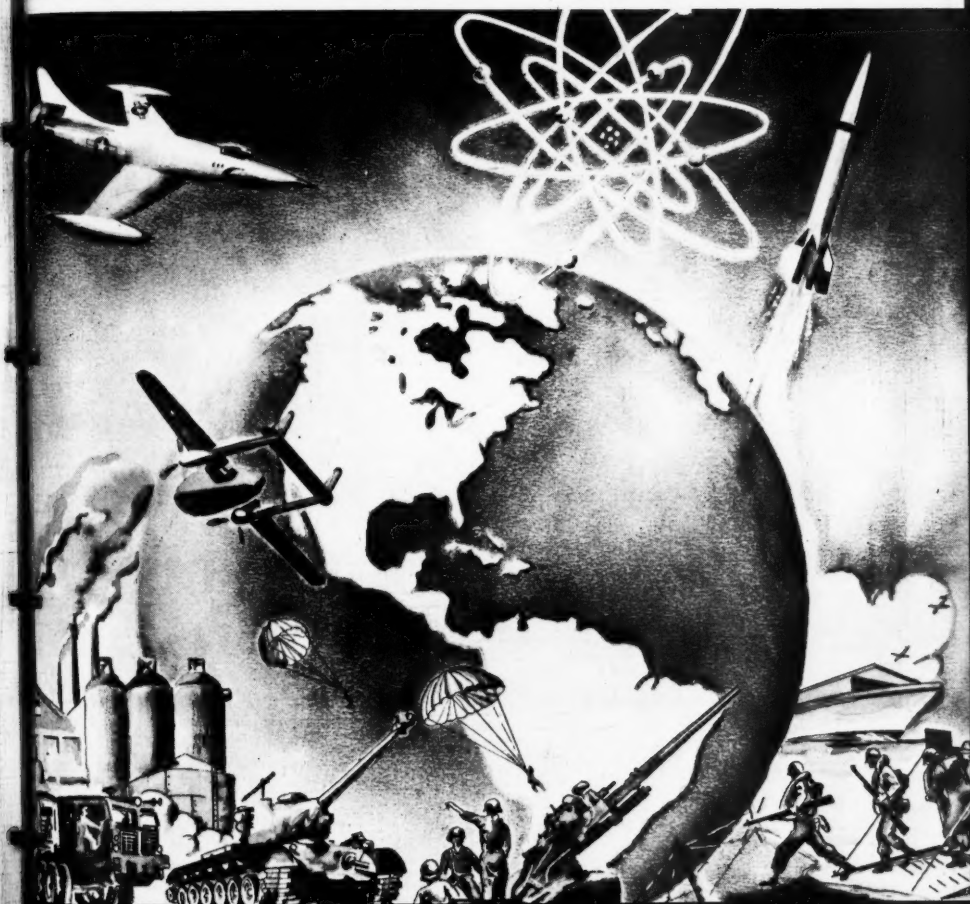


MILITARY REVIEW



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JULY 1958

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POLICY.

Unless otherwise indicated, the views expressed in the original articles in this magazine are those of the individual authors and not necessarily precisely those of the Department of the Army or the U. S. Army Command and General Staff College.

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This copy is not for sale. It is intended for more than one reader.
PLEASE READ IT AND PASS IT ALONG

SURPRISE ON A HILLTOP

Colonel V. J. Gregory, *United States Air Force Reserve, Retired*

CROOK, Custer, Miles. These are the field commanders who pitted their tactical skill against one of their wildest, yet respected foes—Chief Crazy Horse. This Sioux chieftain repulsed Crook, vanquished Custer, and surrendered to Miles.

In terms of historic time, it was only yesterday when proud Cavalry regiments, manned by seasoned, hard-riding war veterans and adventurous youths hit the dusty trails of the western plains in pursuit of Indian tribes that resisted life on fenced-in reservations. The objective was ironic, for the pursuing troops as well as the pursued Sioux and Cheyenne tribes cherished the freedom of the open west. Yet there was one distinction: the soldier responded to duty; the Indian struggled for survival.

Following the Civil War, relentless pressure rolled the Indian across the Missouri River, the vast plain states, and into the Black Hills of South Dakota. As the Sioux recoiled before the Conestoga wagon and the smoke belching locomotive, the trail of invasion and of retreat was marked with bloody skirmishes, raids, and massacres.

Treaty Signed and Broken

Finally—in 1868—Red Cloud, Sioux chief, signed a treaty with the Great White Father under terms of which the Sioux and Cheyenne tribes were allotted an area in the Black Hills. However, the treaty soon was broken. In 1874 Custer's expedition discovered gold in the Black Hills. A stampede followed. Prospectors invaded land reserved for the Indians and Red

Cloud was discredited by his own tribe. Crazy Horse, who had served Red Cloud as his fighting chief; Sitting Bull, the medicine man; and Chief Gall roared defiance and the fat was in the fire.

They struck their tepees, and drifted northwestward across the Bozeman Trail and into the Big Horn Mountains of Montana. Here in a lush valley they set up their villages, defied orders to return to the reservation by 31 January 1876, and awaited the enforcing arm of the Government, the United States troops.

General Sheridan outlined the strategy. General Crook was directed to proceed from Fort Fetterman, Wyoming; Colonel Gibbon from Fort Ellis and Fort Shaw, Montana; and General Terry with Colonel Custer's 7th Cavalry and three companies of the 6th and 17th Infantry, from Fort Lincoln, North Dakota.

They were ordered to converge upon the dissident Indian tribes. The plan of a converging attack by these three commands appeared sound on paper; its execution against a superior resisting force proved faulty. Lack of coordination in time and space passed tactical advantages to the enemy; Crazy Horse was quick to turn the tables on his pursuers.

Crook Attacks

Crook, the "Gray Fox," struck the first punitive blow against a Cheyenne village at the mouth of Powder River, 17 March 1876. This surprise dawn attack on a bitterly cold day failed when his advance

Chief Crazy Horse displayed his tactical ability and strategic insight at the Battle of Little Big Horn. Both Custer and the Sioux-Cheyennes made their last stand—the Indians won the battle but lost the cause

commander, after destroying 100 lodges, was stopped in his tracks. The defending Indian warriors, slipping through the attacking lines, rallied on high ground above the village, returned the fire, and forced the advance commander to retreat. When Crook rushed in with the main body it was



General George Armstrong Custer

too late to repair the damage. He marched back to his base. Crazy Horse vowed vengeance.

During June of the same year Crook returned to the attack. Mounted on his horse, this tall, experienced Indian fighter

Colonel V. J. Gregory retired in 1954 after 33 years of active and reserve duty in the Field Artillery and the Air Force in both World Wars I and II. He attended the Universities of Missouri and Minnesota and completed war courses at the Fort Sill School of Fire and the Command and General Staff School at Fort Leavenworth. An ardent student of military history, he is the author of "Echoes From the Bayou," and "The Barefoot Girl From Domremy," which appeared in the October 1957 and April 1958 issues of the MILITARY REVIEW. He presently is engaged in publication work.

swung in his saddle to survey his four-mile column of marching blue uniformed troops armed with carbines and revolvers. They were seasoned men of the 2d and 3d Cavalry, 4th and 9th Infantry. Entering hostile Indian territory, Crook detached his wagon trains from the main column and pushed ahead at an increased pace. Crossing Tongue River the column advanced to Rosebud Creek and bivouacked.

Attack Fails

Crazy Horse was ready. Assembled on the bluffs were 1,500 of his Sioux and Cheyenne braves armed with tomahawks, knives, and modern breech-loading Springfield, the equal if not the superior of weapons carried by Crook's men. The Sioux chief respected the "Gray Fox" as a fighter and hunter; he was familiar with his employment of relatively small, fast-moving columns to meet the elusive tactics of the Indian.

On 17 June as Crook's advance detachment proceeded cautiously into the valley, it was challenged by rifle fire from the bluffs. The battle developed quickly as mounted and foot elements swung into action. Cavalry squadrons scaled the heights, held the ground momentarily, and then gave way as Crazy Horse rushed in reinforcements. Individual and group fighting spread through the valley in canyons and on bluffs. Crook directed frontal charges and flank movements; however, in fluid situations fronts and flanks vanished in a twinkling of an eye. In this scene of howling pandemonium hand-to-hand combat superseded unified action. Crook's attempt to charge the Indian village failed. The tide of battle rolled on to an indecisive end. Crook returned to his base.

Having cut off one of the main tentacles from the converging force, Crazy Horse moved his village northward to join the encampment west of the Little Big Horn River. An estimated 5,000 warriors made up a third of the total concentra-

tion in this valley. Crazy Horse, Sitting Bull, and Gall took council, decided upon an aggressive course, and dispatched scouts to observe the oncoming force from the north.

During the progress of the Rosebud battle, only a few miles separated Custer's scouting party—led by Major Reno—from General Crook. Reno, however, unaware of the bloody engagement and satisfied that he had gathered sufficient intelligence, returned to the mouth of Rosebud Creek where General Terry awaited him. Reno reported the discovery of a wide Indian trail along the Rosebud which turned westward toward the Little Big Horn River.

Terry's Plan

Thereupon Terry, department commander in charge of the campaign, ordered Custer to march south along the reconnoitered Rosebud trail. He cautioned him to avoid taking the Indian trail leading to the Little Big Horn River, in order to permit the convergence of all participating troops before attacking the hostile camp. However, the order was general rather than specific, allowing Custer latitude in deciding upon a course of action when meeting the enemy.

At the confluence of the Yellowstone and Rosebud in Montana, Terry commanded a force of 1,000 men, including Custer's 7th Cavalry which had marched from its home base at Fort Lincoln. Terry's unit was strengthened by an additional force of 450 infantry and cavalry troops commanded by Gibbon.

Following a conference with Custer and Gibbon, Terry directed Gibbon to move south along the Big Horn River and then along the Little Big Horn River. Under such general plan the conferees believed that the Indians would be compelled to fight, since they would be squeezed by the converging forces. It was feared, however, that the Sioux and Cheyennes, upon learning of the expedition against them, would

escape, thereby nullifying the main objective. They had no knowledge of Crook's encounter with the enemy.

Custer with his regiment of 600 troops and 44 Crow Indian scouts moved out on the morning of 22 June. Each man was allotted 100 rounds of ammunition for his



Chief Crazy Horse
(Artist's Drawing)

carbine and 24 rounds for his revolver. No sabers were carried and Custer sheared off his yellow locks. On the third afternoon, forced marches had brought Custer's 7th to a point on the Indian trail where it twisted to the right. Following a brief rest period, the march was resumed at night along the trail leading to a divide between Rosebud and Little Big Horn valleys. In 24 hours of marching time Custer's regiment had covered more than 80 miles.

At dawn on 25 June Custer's scouts observed thin wisps of smoke curling skyward from an area in the Little Big Horn

valley. To get a personal estimate of the situation Custer trotted to a high vantage point. He peered westward over the silent rugged buttes. He could see no smoke. However, visibility was poor; a deep haze covered the valley floor and the low morning sun skimmed the gauzy surface, bringing into stark relief the tops of tall cottonwoods, standing like sentinels along the course of flowing streams.

Information Lacking

Custer prolonged his survey as the usual questions popped through his agile mind. Where is the enemy? What is his strength? What are his intentions? What are his capabilities? What are his probable lines of action? He needed some definite, tangible clues; he could find none. Perhaps his Crow scouts had been optimistic, at best too imaginative. They had reported the presence of Sioux and Cheyennes in the Big Horn valley. There was no doubt as to the accuracy of that bit of military information. But that was not enough. He had to pinpoint the enemy location. The valley was too big for futile pursuit.

Custer understood Indian warfare; he had fought warring tribes since the end of the Civil War. He was familiar with their bag of tricks, their hit-and-run tactics, their capability of breaking camp within minutes, and of eluding armed pursuit. He was on familiar ground with the Sioux and Cheyennes and they, in turn, feared and respected him. He had beaten numerous tribes on the great western plains.

Custer's Decision

Returning to his command Custer received further reports to the effect that the regiment was under hostile observation. The time for action had come. All questions had to be resolved by a decision, right or wrong. Fearing that the enemy would slip away, he decided to block such attempt.

Custer realized that his decision to split the command presented certain risks. How-

ever, he had been successful with similar formations in previous engagements, the most notable being his victory over Black Kettle's Cheyennes on the Washita River in Oklahoma on 27 November 1868.

Custer outlined his plan of action to his battalion commanders—Captain Frederick W. Benteen and Major Marcus A. Reno. Benteen was ordered to strike off in a westerly direction and reconnoiter the area to the left of the trail. Reno was ordered to move in a northwesterly direction, following the left side of a creek. Custer decided to proceed in a northwesterly direction on the right side of the same creek. The regiment, divided into three battalions, initially started off on a scouting expedition.

Crazy Horse Prepared

To Crazy Horse, whose confidence soared with the fresh victory over Crook's 1,200 troopers, the sight of Custer's regiment, 600 strong, caused no dismay. He was prepared to challenge "Long Hair." The task loomed easier as he observed the three columns marching in three separate directions. He concluded that Custer had failed to locate the Indian village.

Sioux scouts saw Reno's battalion of 112 cavalrymen and 20 scouts advance cautiously toward the Little Big Horn valley, being screened by tall cottonwoods along the creek and the rugged terrain. They observed that Reno remained within sight of Custer whose column moved parallel to his for a distance of about 10 miles. As Reno reached an open space, Sioux scouts noted that he was within sight of the Indian encampment on the west side of the Little Big Horn River. Indian signals flashed as Reno's battalion crossed the river, prepared to charge the village. At 1430 the sun was high, the day warm.

Reno Stopped

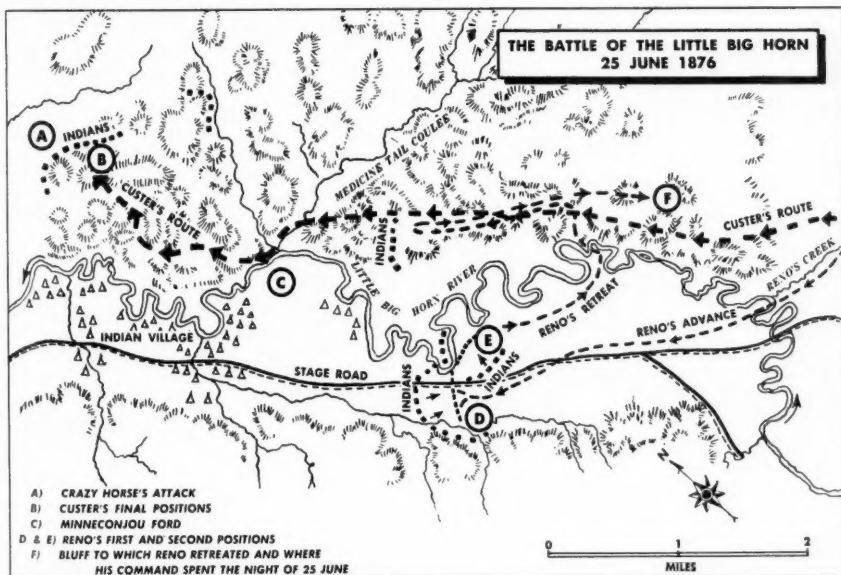
Chief Gall advanced to meet Reno's charge. Mounted Indian warriors swarmed down the valley. Overwhelmed by numerical superiority, the cavalrymen dismounted

to form a skirmish line. Increasing numbers of frenzied Indians joined the fray and Reno's troopers were thrown on the defensive. They withdrew into woods along the river. The pressure continued until the cavalrymen were forced to leap into their saddles and dash for the river—which they crossed—and then scramble for the high buttes where they stopped to establish temporary defenses.

While a small group of warriors pinned Reno to the ground, the main Sioux body

positioned their lesser fighting chiefs. Crazy Horse estimated that Custer, upon sighting the village, would attempt to cross the stream in order to attack it on the flank and rear. Planning to stop "Long Hair" in his tracks, Crazy Horse pointed to the first ridge east of the river, directly in the path of Custer's line of march. That is where he decided to spring the trap.

It appeared to the Indian chieftain that Custer—riding to his fateful destiny—continued to lack definite information as



turned northward toward Custer's column which was observed moving on high ground. The Indians moved stealthily along the river, taking advantage of concealment provided by hills and coulees. Chief Gall rejoined Crazy Horse in the field near their village, reported the successful outcome of the initial encounter, and indicated that he was ready to join in the main attack.

On the gallop, they headed toward the Little Big Horn River to direct the dis-

to the exact location of the village. Moreover, Custer's 40 Crow scouts had been unable to penetrate the screen shielding the movements of Indian warriors as they moved abreast of the 7th Cavalry.

Chief Crazy Horse Strikes

Crazy Horse nodded to his mounted companion, Chief Gall, suggesting that he attack the flank of the oncoming column as it approached high ground. Grimly Crazy Horse viewed Custer's long line as

it disappeared from the bluffs to descend toward Medicine Tail coulee. Crossing the river, Crazy Horse pressed his mount to a position north of the ridge he had selected for the battle. Massing his overwhelming destructive force of 5,000 braves, Crazy Horse was prepared to surprise, confound, develop, encircle, and penetrate the pitifully small group of cavalymen holding their heads high and proudly as they followed their haughty leader, the red bandana around is neck flapping in the summer breeze. The stage was set; savage warriors, crouching behind rocks and thickets, mounted bareback on their ponies in ravines and coulees, awaited the signal.

A few trigger happy Indians fired. Troopers reached for their carbines and revolvers. Custer swirled in his saddle, and barked orders. From the west and south stormed Gall and his Sioux. They pressed against the left flank of the 7th, causing Custer to detach two companies under Captains Keogh and Calhoun who were ordered to fight a delaying action.

Custer continued toward the ridge. Reaching it he beheld the Indian village across the river, spread out over a wide area in the valley. There was his objective. Stubbornly he wheeled his command and prepared to charge the enemy line in order to reach his goal. But he was stopped cold.

From a ridge below the one he occupied, rose Crazy Horse with his yelling Sioux and Cheyennes. Surrounded on all sides, the cavalymen dismounted and spread out to form a defensive line. Mounts were shot to provide breastworks; others stampeded, carrying saddlebags filled with ammunition.

The attack was savage, complete, and swiftly executed. Indians encircled and penetrated the diminishing lines of troopers. Custer's men fought to the death, gallantly, bravely, courageously, against odds of at least 20 to one. No prisoners were taken. No troopers escaped. Comanche, Captain Keogh's horse, wounded in seven places was the sole survivor of the 7th on that bloody field. The main action was over in less than an hour.

In that brilliant flash of flame on a tiny ridge in Montana both Custer and the Sioux-Cheyennes made their last stand. The Indians won the battle but lost the cause.

Conclusion

Whatever remains to be questioned with respect to Custer's tactical judgment, the battle conduct of the 7th Cavalry, including that of its 37-year-old commander, was as glorious as that of the Light Brigade or of Pickett's Charge.

Following up their victory, the Indians swooped southward, renewing their assault on Reno's decimated battalion which was strengthened by Benteen's unit. Fighting continued the following day; rescue was effected by Terry and Gibbon.

Crazy Horse's days were numbered. Relentlessly pursued by Federal troops he finally surrendered to Miles on 8 January 1877, following a desperate battle on Tongue River in Montana. Yet the spirit of a free life remained unquenched; civilized shackles he resisted to the end. A guard's fatal bayonet thrust shut off the last defiant gesture made by Chief Crazy Horse, one of the great fighting chiefs in the days of the open west.

MOVING?

If you are moving, please notify the MILITARY REVIEW, Fort Leavenworth, Kansas, of your change of address. Be sure to include your name, *old* address, and *new* address.

THE UNITED STATES COAST GUARD

Material for this article was furnished by United States Coast Guard Headquarters, Washington, D. C.—Editor.



Coast Guard ensign

THE United States Coast Guard occupies a unique position in our defense structure. In peacetime, under the Treasury Department, it serves as our foremost agency for protection of life and property at sea. In wartime, or on direction of the President, it becomes part of the Navy.

History

The history of the Coast Guard dates back more than a century and a half to the beginnings of the United States. The Nation dates from the Declaration of Independence, 4 July 1776, but the constitu-

tional government we know today did not start until 1789. This was the year George Washington was inaugurated as President and the first Congress convened in New York, the first capital. The next year, on 4 August 1790, Congress passed and Washington signed a bill authorizing the construction of "10 boats" for guarding the coast against smugglers.

The first of these cutters, launched in 1791, was the *Massachusetts*. Her deck length was only 50 feet, her beam 17½; her draft seven feet three inches, and her armament six light swivel guns. Her nine sister cutters were still smaller, ranging downward to 30 tons. Yet for eight years, until the Regular Navy was organized in 1798, these tiny wooden sailing ships were the young Nation's sole naval force.

Major Functions

Today, after more than a century and a half, the Revenue Marine, as it was first called, has grown into the powerful, far-flung establishment of ships, planes, and stations that we know as the Coast Guard. It still keeps smugglers in check, but to that original assignment have been added innumerable other duties, which for convenience may be grouped into three general categories:

First, the Coast Guard is a safety agency. Charged with the protection of life and property at sea, it maintains ships to report on midocean weather conditions; ice patrols to warn of the dangerous bergs; and Loran (long range aid to navigation) stations, lighthouses, and buoys to guide mariners safely to land. When accidents occur despite all safety

True to the traditions of more than a century and a half of service to America, the Coast Guard is continuing to carry out its manifold assignments—in peace as in war its job is a big one, its tasks varied

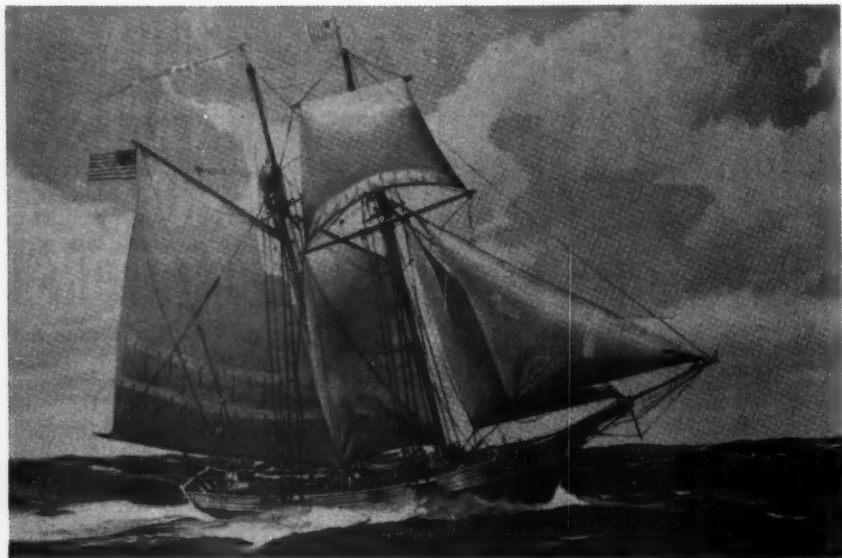
precautions, there are lifeboat stations to cope with emergencies along the shore and Coast Guard planes, helicopters, and cutters for long-range assistance operations. When necessary, the Coast Guard requests merchant vessels to assist in rescue work.

Second, the Coast Guard is an enforcement agency. As such, its task is to see that Federal laws are observed on the high seas and navigable waters of the United States. This means all Federal

manpower of 171,000 and distinguished itself in all theaters of war, particularly in amphibious assaults, antisubmarine warfare, and port security work. At present, the Coast Guard has a strength of 3,500 officers and 26,000 enlisted personnel.

Navigational Aids

As part of its function of promoting maritime safety, the Coast Guard maintains numerous aids to navigation. One



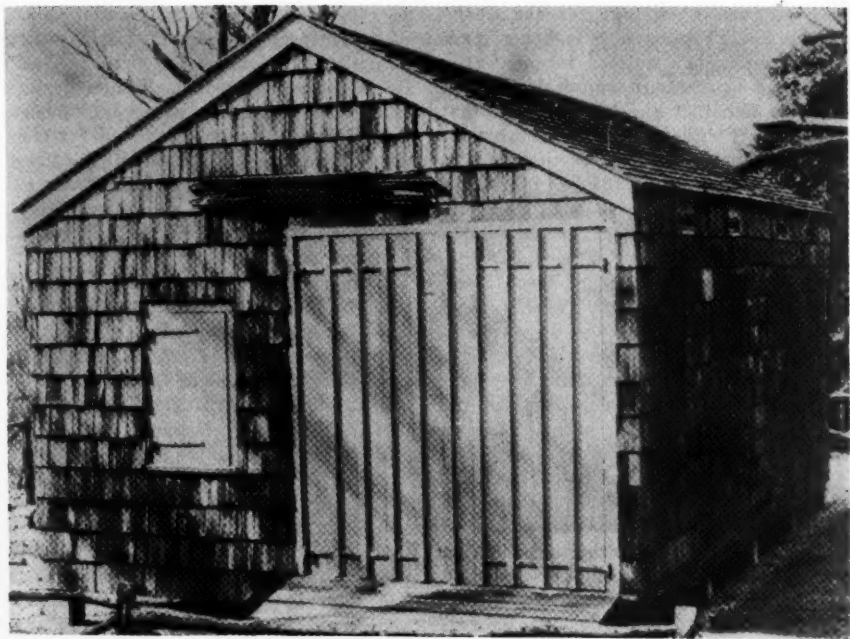
The first cutter, the *Massachusetts*, launched 1791

laws, but violations of statutes governing immigration and customs, operation of merchant ships and motorboats, and oil pollution of waterways are a particular concern of the Coast Guard.

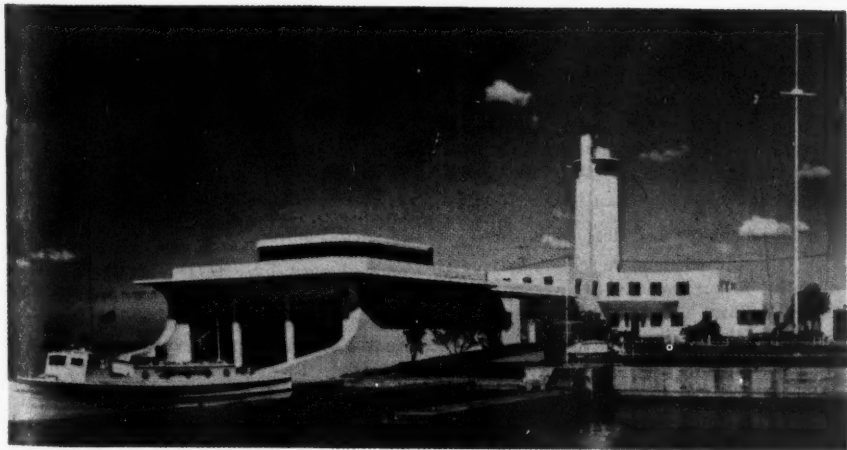
Third, the Coast Guard is a part of the Nation's Armed Forces. Transferred in wartime or on direction of the President from the Treasury to the Navy, the Coast Guard has fought with distinction in every war in which the United States has been involved. In World War II it reached peak

of the most important of these is Loran. Serving essential wartime as well as peacetime needs, this electronic aid was born shortly before United States entry into World War II. The Coast Guard took an active part in its development, and by war's end it extended from Greenland to Tokyo. In 1957 the Coast Guard maintained 49 Loran stations in the Atlantic, Pacific, and Gulf of Mexico.

Currently, work is going forward on construction of seven Loran stations to



First lifeboat station, 1849



Cleveland Coast Guard station

provide partial coverage for the Caribbean area. Progress also is being made on six additional stations in the Caribbean and at southern approaches of the Panama Canal. It also is anticipated that negotiations with foreign governments for construction of additional stations will be completed in the near future.

The Coast Guard has contributed significantly to development of such additional electronics facilities as Radar (radio detection and ranging), Racon (land radar beacon), and Anrac (aids to navigation radio control).

Cooperation with the Navy in far northern operations constitutes an important part of Coast Guard operations. In the summer of 1957 a task group made up of the Canadian vessel *HMCS Labrador* and three United States Coast Guard vessels, *Storis*, *Bramble*, and *Spar*, successfully accomplished a deepwater northwest passage through the hitherto uncharted wastes of Bellot Strait in the Canadian Northwest. The group operated under the Military Sea Transport Service. By cutting through one of the most inhospitable regions on earth, naval pioneers not only reduced by hundreds of miles the route which deep-draft ships must take to reach Baffin Bay but, more important, found a sea path which reasonably could be expected to be free of impassable ice in summer. This development was of vital importance in supplying the Distant Early Warning Line along the top of the North American Continent.

Merchant Marine Responsibilities

A safe and efficient merchant marine is essential to our national well-being. Since 1942 the Coast Guard has been associated closely with administration of the merchant fleet. In striving toward the objective of sound and seaworthy ships and fit and competent crews, the Coast Guard maintains an intensive inspection program. All US passenger ships of 100 gross tons and more propelled by machinery are sub-

ject to safety inspection by Coast Guard marine inspectors. Merchant marine safety activities now employ a fourth of Coast Guard officer personnel. Besides testing and inspecting life-saving equipment, these officers examine boat crews for their own and passengers' protection. The Coast Guard also has the responsibility for supervising loading of explosives. These peacetime functions are tied directly to national defense.

In carrying out its maritime safety duties, the Coast Guard in 1957 completed 5,964 inspections of merchant vessels with a gross tonnage of 18,795,759 tons; made drydock examinations of 4,598 vessels with a total tonnage of 17,135,444 tons; carried out 18,064 miscellaneous inspections, and reviewed plans for 19,807 merchant vessels.

For more than a century and a quarter, search and rescue has been a major Coast Guard function. Since 1831, when the first winter cruise was ordered to aid seafarers and ships in distress, Coast Guard men and ships have saved thousands of lives and billions of dollars in property. Among more dramatic search and rescue operations carried out in recent years were the rescue of the 31 passengers of a ditched Pan American clipper by the cutter *Pontchartrain*, 16 October 1957, and the removal of 33 persons from the storm-lashed German freighter *Helga Bolten* by the cutter *Chincoteague* on 30 October of the same year.

The Coast Guard's primary responsibility for marine safety was reaffirmed by the National Search and Rescue Plan promulgated by the Department of Defense in April 1956. In the plan the Coast Guard has been designated Regional Search and Rescue Coordinator for the Maritime Region.

Other Missions

Aviation plays an important part in Coast Guard operations. Coast Guard aircraft in World War II rescued many sur-



Diesel-driven, 95-foot patrol boat

vivors of torpedoed vessels and also carried out bombing attacks on submarines. Within the past several years the Coast Guard has pioneered in adapting helicopters for use in difficult air-sea rescues and in assisting flooded areas. In 1957 Coast Guard aircraft flew a total of 19,828 missions assisting 339 distressed aircraft, making 19 open-sea landings, and carrying out 126 helicopter hoists.

Another important function is the conduct of ocean weather patrols initiated in 1940, shortly after the start of war in Europe. At that time two Coast Guard cutters were assigned to observation stations between Bermuda and the Azores. Currently, 34 vessels are employed in the ocean station program in the Atlantic and Pacific. Information relayed by these vessels is of great assistance to transoceanic ships and planes.

To the Coast Guard's many other duties must be added the traditional and highly important task of law enforcement on the

high seas. This function forms a part of the complex pattern of operation of this versatile service.

No discussion of the Coast Guard would be complete without mention of the various shore establishments that contribute so much to the over-all efficiency of the organization.

Among these are included the training stations and schools, the Coast Guard Yard, and the Coast Guard Academy at New London, Connecticut.

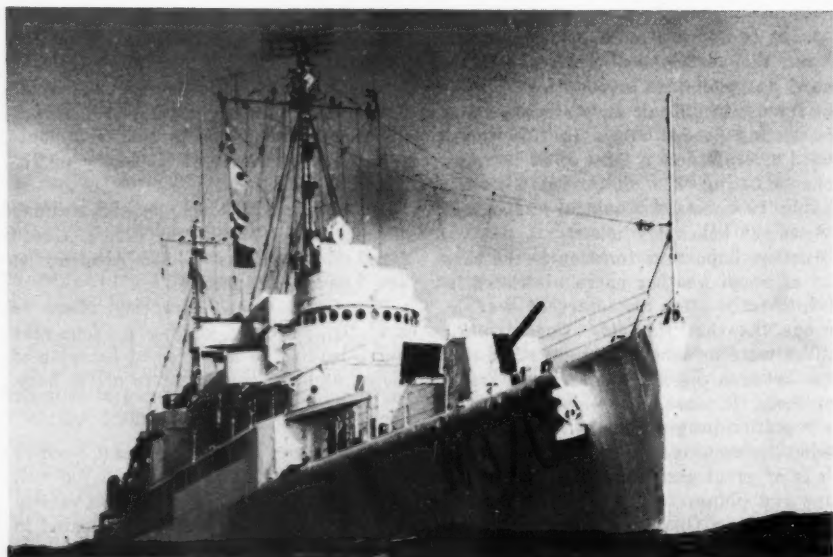
The Coast Guard Academy offers to carefully selected youths a four-year course leading to a degree of bachelor of science and an assignment to active duty.

Conclusion

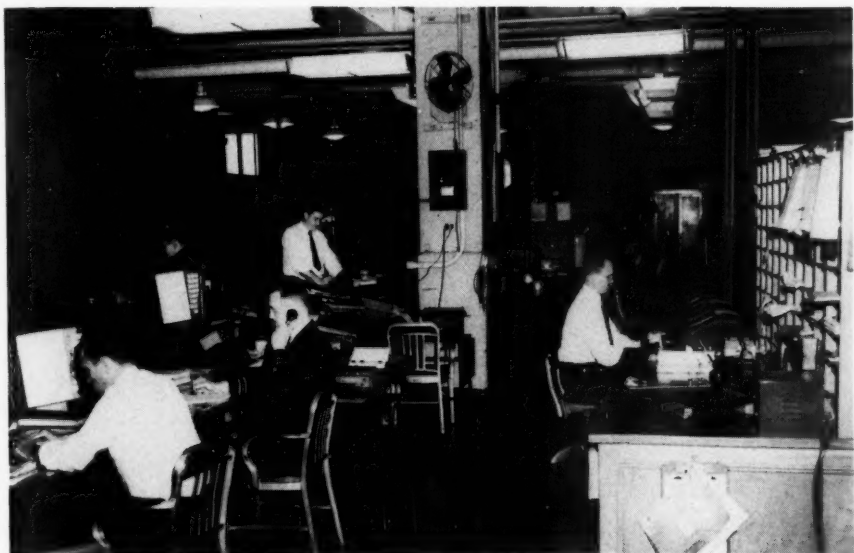
In peace and in war the Coast Guard's job is a big one. It is to do that job well that the Coast Guard operates the variety of ships, planes, and stations indicated in these official United States Coast Guard photographs.



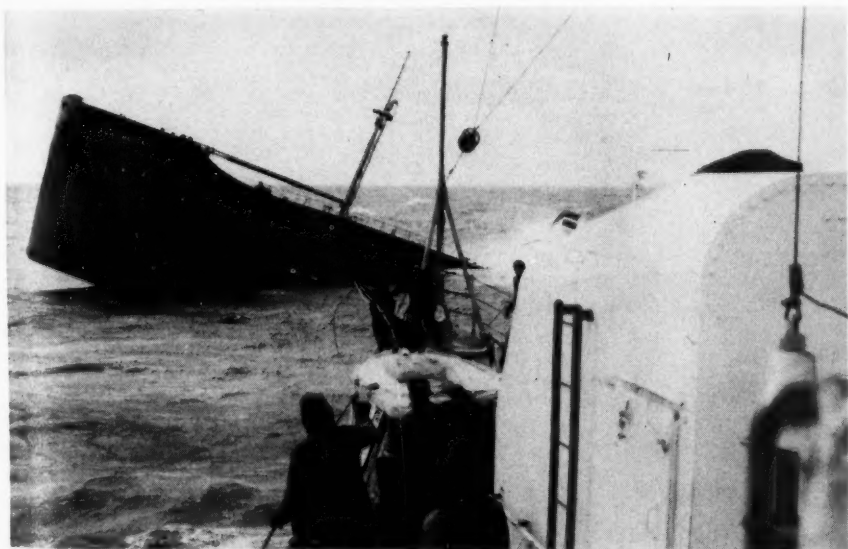
The Coast Guard Academy



The *Casco*, one of many Coast Guard cutters rotating on ocean station patrol



Eastern Area's Rescue Coordination Center



US Coast Guard crewmen rescue survivors of broken tanker *SS Fort Mercer*



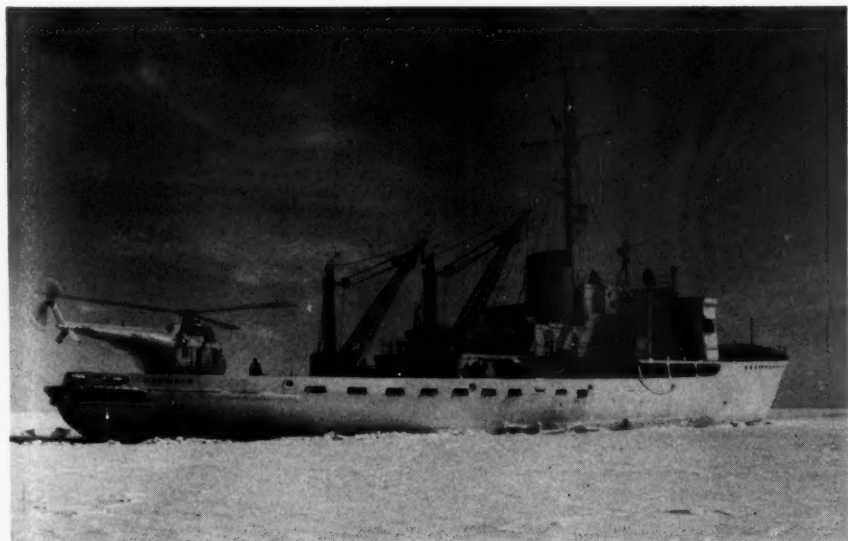
Marlin "T" Tail seaplane



The Albatross, twin-engine monoplane amphibian



A HO4S-3 helicopter tows the 75-ton buoy tender *Birch* during tests



Icebreaker *Mackinaw* specially designed and built for icebreaking on the Great Lakes



Heavy-duty icebreaker *Northwind* (above) leads the way east through the Bering Sea for ships destined for DEW Line radar stations in the Arctic. Below, US Coast Guard cutters *Storis*, *Bramble*, and *Spar* breaking the heavy ice in Simpson Strait.





Above, is the rescue Navy *Otter* plane being delivered by the icebreaker *Eastwind*. With only her bow visible, the icebreaker *Eastwind*, shown below, waits for the Navy's giant icebreaker *Glacier* to dispose of her cargo at McMurdo Sound unloading point.



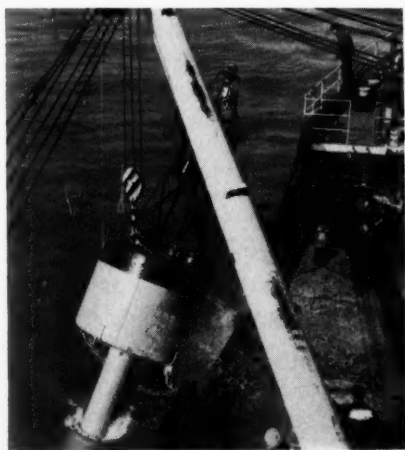


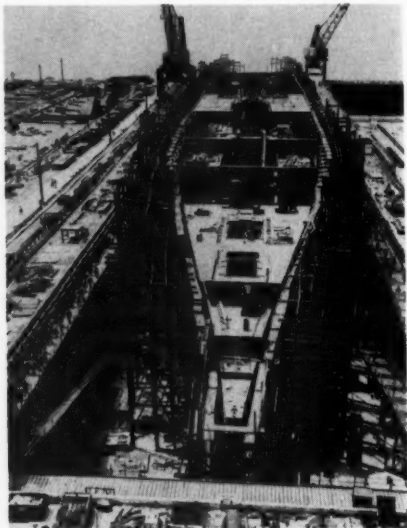
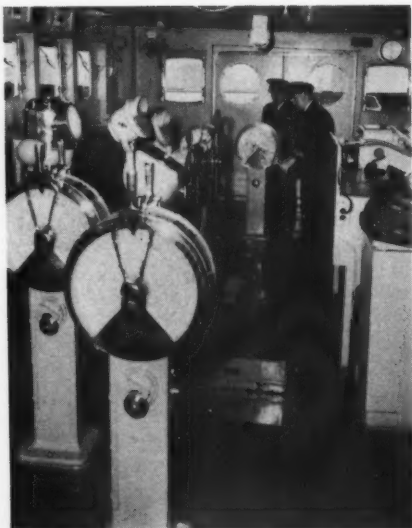
Anchored off Unalakleet, Alaska, the United States Coast Guard cutter *Klamath*, shown above, serves as a floating dispensary during the health mission phase of the Bering Sea Patrol. Below, Eskimos of Shismaref, Alaska, near the Arctic Circle, arrive in an oomiak to keep an appointment with the dentist on board the cutter *Klamath*.





Above, is the *Campbell*, one of the Coast Guard's largest gunboats. Below left, a radio beacon buoy being set into position in Amherstburg Channel, Michigan. Below right, the *Ambrose* lightship marks the entrance to New York Harbor, and to the right is the Norwegian-American Lines Luxury liner *Oslofjord* outbound to Europe.





Above left, a US Coast Guard inspector tests an ocean liner's communications system. In the early stages of construction, the ship (above right) will be subject to inspections until she can no longer sail. Below, cutter *Storis* maneuvers into position to assist volunteer firemen battle blaze at Juneau Cold Storage Plant, Alaska.



The Leninist Revival In Soviet Military Doctrine

Walter Darnell Jacobs

“WHEN we speak of the triumph of communism,” Lieutenant General Nikita S. Khrushchev recently said, “we by no means have in mind making war against any country to establish by force the way of life we want. Neither Lenin nor Stalin ever said so, and we do not say so.”

Khrushchev, as one of the lineal political descendants of Lenin, has a claim to interpretative rights in the dogma called “Marxism-Leninism.” Khrushchev’s claim to the right of exegesis cannot be an exclusive one. Non-Communists have a right, and indeed a duty, to look into the body of Marxism-Leninism and to determine for themselves the validity of the current Soviet treatment of their ideological heritage.

At present, several factors combine to focus attention on the content and meaning of Marxism-Leninism in general and of Leninism in particular. The replacement of Stalin by Lenin in the Communist neurological hierarchy tends to focus attention on Lenin’s doctrinal works. This emphasis is found both in Soviet statements and in Western studies of operational and axiological communism. Soviet attacks on Stalin as a military leader have forced Soviet subjects to look elsewhere for acceptable authority on military matters. With almost Pavlovian precision they have turned to Lenin.

Non-Communist interest in Soviet military doctrine has been sharply excited as

a result of Soviet accomplishments in scientific fields, particularly in rocketry and nuclear physics, which are closely allied to the military potential of the USSR. These real accomplishments have been accompanied by discernible trends in doctrinal matters.

These trends have a definite ambiguity about them. In the political field the emphasis is on “peaceful coexistence and competition,” while in the military field the emphasis seems to be on internal Soviet attempts to liberate their own thought from the restrictions of Stalin’s “permanently operating factors.” This attempt has accelerated the tendency of Soviet military publicists to reemphasize the writings of Lenin on war, armies, and military science.

The reemphasis in Soviet circles on the military side of Leninism, and on Leninism in general, makes a new examination of Lenin pertinent.

Early Studies Valid

Earlier reliable Western examinations retain their validity. The present study builds on those works and is indebted to them. The purpose here is to supplement those pioneering efforts by a re-reading of Lenin in light of recent developments.

Among Lenin’s earliest essays, although not his first, on military matters is the famous “What Is to Be Done?” written in 1901 and 1902. In that work Lenin already was considering the role of doc-

The Soviet deemphasis on the theories and concepts of Stalin has resulted in increased prominence being given to the teachings of Lenin as they pertain to the military and the political aims of the USSR

trine in war and the importance of appearances in armed struggle. He said:

(I) It is necessary to have an organization of experienced revolutionists. In such an organization belief in the strength of the party would be the stronger and the more widespread as the organization was more conspiratorial—and, in time of war, it is a well known fact that it is of utmost importance not only to imbue one's own side but also the enemy and all neutral elements with belief in the strength of one's own forces; friendly neutrality may sometimes decide the outcome [of battle].¹

This tactical, organizational, rhetorical injunction is typical of the early conspiratorial Lenin. It is a tone that runs through "What Is to Be Done?" like a scarlet thread. It is a part of the "revolutionary theory without which there can be no revolutionary party." The essence of "What Is to Be Done?" is this demand for organization strongly flavored with conspiracy.

The 1905 essay "The Fall of Port Arthur" exhibits Lenin as a perverse Russian taking a rather distorted delight in the defeat of the czar's armies by the Japanese. It is a continuation of the

¹ V. I. Lenin *o Voine, Armii i Voennoi Nauke* (V. I. Lenin on War, The Army and Military Science) Volume I, p. 26. Moscow, Voennoe Izdatel'stvo, 1957, Two Volumes (hereafter cited as *Lenin o Voine*).

Mr. Walter Darnell Jacobs was on active duty in the Army from 1942 to 1953. A graduate of the Army Language School (Russian Course), he received the Master of Arts degree in Political Science from Columbia University as well as the Certificate of the Russian Institute in 1956. A frequent contributor to the MILITARY REVIEW, his most recent articles have been "Mao Tse-tung as a Guerrilla: A Second Look," and "Irregular Warfare and the Soviets," which appeared in the February and May 1958 issues. Until September 1957 Mr. Jacobs was associated with the Library of Congress where he was responsible for the Exchange Program with libraries and institutions in the Soviet Union. He presently is at Columbia University studying on a Ford Fellowship.

"What Is to Be Done?" line and a transfer of that line to almost purely military considerations. Lenin, however, never viewed military matters in pristine isolation from their political surroundings. He saw the fall of Port Arthur not only as a "military collapse suffered by the autocracy" but also and more importantly as "a sign of the breakup of our entire political system." Lenin was delighted with the prospect of such a breakup. He was delighted with the prospect and, at the same time, he made the conspirator's analysis of the role of war in bringing about that breakup.

The lesson of Port Arthur in Lenin's eyes is that "war is now waged by the peoples." He continued:

The connection between the military organization of a country and its entire economic and cultural system has never before been so close as it is at the present time. . . . The military collapse cannot but signify the beginning of a deep political crisis. The war of a progressive country against a backward one plays, in this case as it has repeatedly in history, a great revolutionary role.²

In this same essay, Lenin set out what was to become the standard socialist formulation on the inevitability of war. "The revolutionary proletariat must indefatigably agitate against war," he declared, "always remembering, at the same time, that wars are unavoidable while class rule holds sway generally."

This formulation has been repeated, with minor, almost imperceptible variations, throughout the period in which the ideology of communism has been propagandized. In 1915, for instance, Lenin said that "under capitalism, and especially in its imperialistic stage, wars are inevitable."

Again, in 1917, he said:

Only after we have overthrown, finally vanquished, and expropriated the bour-

² *Ibid.*, p. 51.

*geoisie of the whole world, and not only of one country, will wars become impossible.*³

Basic Alteration

Today, in the age of "peaceful co-existence," the formulation is somewhat different. At the 20th Party Congress, Khrushchev made what has been interpreted in some quarters as a basic alteration in the axiom. He said:

As long as capitalism survives in the world, the reactionary forces representing the interests of the capitalist monopolies will continue their drive toward military gambles and aggression, and may try to unleash war. But war is not fatalistically inevitable. Today there are mighty social and political forces possessing formidable means to prevent the imperialists from unleashing war, and if they actually do try to start it, to give a smashing rebuff to the aggressors and frustrate their adventurist plans.

Khrushchev also told the 20th Party Congress that "Lenin teaches us that the ruling classes will not surrender their power voluntarily" and "we must be guided by these wise injunctions of Lenin in all our activities."

Lenin, in 1905, was quite certain that the Russian "autocracy" would not surrender its power voluntarily.

He had established to his satisfaction the proposition that wars are inevitable in the capitalist era and that wars play a great revolutionary role. He was convinced that "only an armed people can be an effective stronghold of popular freedom." The element of forcible, armed opposition and its application to the then contemporary situation was his next consideration.

Lenin's Solution

Armed insurrection in all its varieties and in full panoply was the solution that Lenin, as an apt student of Marx, advocated. Under this rubric, he included

riots, strikes, street battles, illegal demonstrations, mutiny, and other forms of open opposition to constituted authority.

In 1905 he wrote the essay, "The Revolutionary Army and Revolutionary Government," which examines all varieties of armed insurrection and decides that a revolutionary army is necessary. It is necessary because:

*Only with force can great historical questions be decided, and the organization of force in the contemporary struggle is the military organization.*⁴

Not only a revolutionary army but also a revolutionary war is necessary, Lenin claimed, because:

*We cannot destroy this exploitation without war, which is always and everywhere begun by the exploiting, ruling and oppressing classes.*⁵

Lenin admitted, however, that the organization of a revolutionary army is a "difficult, complicated, and long process." Until such an army is organized, revolutionary detachments of "any number, beginning with two or three men" should be active in the field of "independent military activities" and "leadership of the crowd." These detachments should arm themselves where weapons of any type are available ("rifle, revolver, bomb, knife, brass knuckles, stick, rag with kerosene for arson, rope or cord ladder, spade for the construction of barricades, slab of gun cotton, barbed wire, nails [against cavalry] and so forth and so on"). These detachments should go into action without waiting for further instructions. Fulfillment of the slogan of "Insurrection!" is to be the aim; any action leading to that end is authorized.

In March 1906 Lenin asked the United Congress of the RSDRP (Russian Social-Democratic Workers Party—the pre-revolutionary Communist Party) to acknowledge:

⁴ *Ibid.*, p. 131.

⁵ *Ibid.*, p. 133.

³ *Ibid.*, p. 516.

That armed insurrection is, at the present time, not only a necessary means of struggle for freedom but already a factually realized stage of the movement, which, in intensifying and aggravating a new political crisis, makes possible the transition from defensive to offensive forms of the armed struggle.

Views on War

The events on which Lenin had based this recommendation were not, as he hopefully claimed, civil war. They were forms of armed insurrection on a limited scale. One of the forms, resulting from the activities of "revolutionary detachments," was partisan warfare. Lenin held that partisan warfare properly could be utilized at that stage of the struggle because Communists base their choice of the forms of struggle on "strictly defined ideological and organizational conditions."

Lenin's concept of war as an existential phenomenon reiterates his concept of its practice described here. The practice of war in Lenin's doctrine is based on the operative ideas of organization, conspiracy (rhetorical), propaganda, and flexibility. His gnosis of war follows his praxis.

Lenin's science of war is dominated by two borrowed phrases. One—"War is simply the continuation of policy by other (namely, forcible) means"—is borrowed from Clausewitz. The other, borrowed from somewhat closer ideological relatives, Marx and Engels, is the claim from *The Communist Manifesto* that "the working men have no country."

From his Marxist interpretation of the famous Clausewitz maxim, Lenin has developed his views of just and unjust wars, of the inevitability of wars in the epoch of capitalism, of the many-sided nature of war, and of the inutility of antiwar policies on the part of socialists. From the related idea of a stateless working class, he has developed his views of the role of civil war, of the character of wars in their historical per-

spective, of war as a stage of capitalism, and of the inevitable triumph of the working class.

Lenin claimed that Marx and Engels "always considered every war as a continuation of the policy of certain interested powers—and of different classes among them—at a given time." He maintained that wars always have been and continue to be "inseparably united with that political system from which [they] flow."

It is but a short step in Leninist logic to a demonstration that those wars are "just" which serve the interests of the working class and those are "unjust" which do not. It is similarly simple, if Lenin leads and the reader follows without carping over a world of assumptions and leaps, to show that "unjust" imperialistic wars are results of the capitalist system and will be inevitable so long as there is capitalism.

Complexities

Wars, as continuations of policy by other means and as essential to capitalism, are, to Lenin, many-sided. The "crude and ignorant view" that wars could be viewed simply as breeches of the peace and then a reversion to peace again is rejected by Lenin.⁶ The basic point of view taken by Marxists in regard to war is the idea by Clausewitz out of Marx that all wars are continuations of policy by other means. This is not a simple military or political view, however. The historical and economic policies must be considered as well.

Clearly, an ideology based on a gnostic view of history in which the economic factors are determining would seem to require that the historical and economic factors in war be given a prominent place in the conceptual framework. "War," Lenin asserted, "must be placed in the historical setting in which it occurs," and

⁶ *Lenin o Voine*, op. cit., Volume II, p. 76.

⁷ *Ibid.*, Volume I, p. 421.

"Marxism demands an absolutely historical examination of the question of the forms of struggle." Of the economic factors, Lenin remarked that "war is a trial of all the economic and organizational forces of any nation."

War is a many-sided affair, involving economic, historical, and ideological matters as well as military and political questions. This is true, Lenin held, because war is a continuation of policies by other means. These policies are a sort of continuous flow; they flow into war and out of it into the subsequent peace and into war. In fine, there is no essential difference to Lenin between war and peace. The differences are accidental and superficial.

Communist Aims

Why, then, should not socialists be against war? Why should they not oppose the series of war which they view as springing from the institution of capitalism? Why should they not adopt a policy of opposing war and of attempting to gain their ends by the insurrectional, conspiratorial, and organizational means in which Lenin is such a self-admitted expert?

For Lenin, the answer to these questions is as simple as the putting of the questions is offensive. The aim of the propaganda of peace is "a means to create illusions, to corrupt the proletariat with a hypnotic confidence in the humanism of the bourgeoisie."⁹ Peace, true peace, is possible, according to a practicing Communist, only with the abolition of capitalism. It is professed by Lenin that "Socialists cannot, without ceasing to be Socialists, be opposed to all war."

In the essay, "The Proletarian Revolution and the Renegade Kautsky," Lenin gave the following instructive views on war:

(To) talk about violence in general, without examining the conditions dis-

tinguishing reactionary from revolutionary violence, means being a Philistine who renounces revolution, or else it means simply deceiving oneself and others by means of sophistry.

The same holds true of violence against nations. Every war is violence against nations, but this does not prevent Socialists from being in favor of revolutionary war. The class character of war—that is the fundamental question confronting a Socialist.

From this it is clear to Lenin that "war is not a sin";¹⁰ on their nature wars cannot be condemned. They may serve a revolutionary purpose—something that a propagandizing of pacifism can never do except in cases in which the government of the state is engaged in an international war which is not in the interests of the working class.¹⁰

Civil War

Various types of war are suited to the purposes contemplated by Lenin. Civil war, however, is the paragon. Civil war is an advanced, exacerbated stage of the class struggle within the state. It is the goal toward which the insurrectional efforts are all directed.

A prime revolutionary advantage of civil war as a type is that it forces class members to take sides. "Civil war," Lenin reminded his readers, "does not know neutrals." In civil war, he added, it is an extremely complicated matter to establish a border "between 'combatants' and 'noncombatants'."

The very complicated and all-encompassing character of civil war is its virtue. It serves to sharpen class distinctions and to force everyone to identify himself with one or the other camp, that is, with a class. Identification with a class may be an indefinite affair in calm times. In civil war, however, that will all be quite different according to Lenin, who said:

⁹ Ibid., p. 375.

¹⁰ Ibid., p. 354.

¹⁰ Ibid., p. 375.

Civil war is the sharpest form of the class struggle and the sharper this struggle, the quicker will petty bourgeois illusions and prejudices be consumed in its fire, the more obviously will it be demonstrated to even the most backward layer of peasants that only the dictatorship of the proletariat can save him and that the [other Socialist parties] are merely servants of the land owners and capitalists.

Civil war is, in addition to its class character, the only exit from imperialist war according to Lenin. It is by civil war that imperialist wars, which serve only the exploiting and oppressing classes, can be turned to the service of the working class.

Civil war, imperialistic war, and armed insurrection are all facets of the continuing class struggle and all offer opportunities to the working class and its vanguard, the Communist Party. The working class can utilize these forms of struggle in order to aid in the "inevitable" destruction of the bourgeoisie.

Clash With Imperialists

Lenin's famous and oft-quoted epigram makes this understandable, or rather, he rationalizes it from the viewpoint of survival on a physical level. In 1919 he told the Eighth Congress of the Communist Party:

We live not only in a state, but in a system of states, and the existence of the Soviet Republic together with the imperialist states for a long time is unthinkable. In the end, one or the other will triumph. And until this end comes, a series of the most horrible clashes between the Soviet Republic and the bourgeois states is inevitable. This means that the ruling class, the proletariat, if it wants to and will govern, must indicate this will by its military organization.

These adages were not coined by Lenin in order to attempt to solve the paradox of calls for spontaneous action by the work-

ing class to achieve what is already inevitable through the working of the materialistic dialectic of history. They were designed to show that the struggle of the Communist was a real one in a real world, but that, in the long run, Communists need not despair. History, Lenin assured them, is on the side of the Marxists. If the workers could not read the lessons of history, Lenin would read those lessons for them.

He read the lesson the Russian Revolution provided for them when he said:

The Russian Revolution has shown that war leads inevitably to the collapse of the entire capitalistic society, that it is transformed into a war of the workers against the exploiters. This is the significance of the Russian Revolution.¹¹

When the Russian workers attained the dictatorship of the proletariat and began to build socialism and communism, they also may have begun to suppose that their period of struggles in which blood was spilled were over. They might have thought that now the workers of the other countries of the world would go through the cycle they had completed—the cycle of strikes, demonstrations, street battles, civil war, and other steps along the road to Utopia. They were, however, not only mistaken, if they thought in this manner, but also miserably inept readers of Lenin.

It is true, according to the dogma of Leninism, that "imperialist war opens the era of socialist revolution"¹² and all the good things that flow to the workers. But, Lenin does not let his readers forget that:

The victory of Socialism in one country does not at one stroke eliminate all war in general. On the contrary, it presupposes such wars. The development of capitalism proceeds extremely unevenly in the various countries. . . . From this it follows irrefutably that Socialism cannot achieve

¹¹ Ibid., Volume II, p. 320.

¹² Ibid., Volume I, p. 444.

will achieve victory first in one or several countries, while the others remain bourgeois or pre-bourgeois for some time. This must not only create friction, but a direct striving on the part of the bourgeoisie of other countries to crush the victorious proletariat of the socialist state. In such cases war on our part would be a legitimate and just war. It would be a war for Socialism.¹²

The news that the achievement of socialism in one country did not signal the beginning of paradise on earth and immediate salvation in history for the workers of Russia undoubtedly was a deep disappointment to some. The promised help from the workers of other countries did not come either. The revolution in Germany, in which so much faith was placed by Lenin, did not take place. Lenin undertook to reassure the proletariat of the country of victorious socialism. "The revolutionary movement," he said "is growing in all the world, though more slowly than we would like." There was no reason not to be of good cheer, however, because "we know that the victory of the working class in all the world is assured."

Wars Necessary

These optimistic (and necessary) assurances tended to overlook the matter of war. "Reactionary imperialistic wars," Lenin reported in one of his last works, "are inevitable in all corners of the world." He delineated the matter of inevitability and mere possibility of wars of other types when he said:

*Civil wars of the proletariat against the bourgeoisie for socialism are inevitable. Wars of socialism, victorious in one country, against others, bourgeois or reactionary, are possible.*¹⁴

On this basis the continued bleeding of the workers for socialism is rationalized.

The need for an army, one of the main elements of the oppressive power of the state according to Marxism, is likewise rationalized. A new stage has been attained, to be sure, but war, in all its forms, continues to occupy its place of primacy in Communist doctrine.

Certain most pertinent aspects of Leninist military doctrine have not been considered here. They have been thoroughly and reliably examined elsewhere. For instance, Fedotoff White has done an exhaustive study on the internal debates on militia versus regular army.¹⁵ Other studies, notably those of Garthoff,¹⁶ Possony,¹⁷ Taracouzio,¹⁸ and Liddell Hart's collection of essays,¹⁹ have covered other aspects.

It is probably true, in general terms, as Byron Dexter says in *Confluence*, that "Soviet doctrine of war is familiar enough." Its meaning to the West increases in importance with each day. Its familiarity is general enough to make a look at Soviet views of their own doctrine, of Lenin's doctrine in this case, rewarding.

Recent Publications

In this connection two collections of essays of strikingly similar titles recently have been published in the Soviet Union. One, issued in 1955 before the denigration of Stalin, is entitled *Marksizm-Leninizm o Voine, Armii i Voennoi Nauke* (Marxism-Leninism on War, the Army and Military Science). The other, published in 1956 after the completion of the 20th Congress of the Communist Party, is entitled *Marksizm-Leninizm o Voine i Armii* (Marxism-Leninism on War and the Army).

Both books are collections of essays

¹⁵ Dimitri Daniel Fedotoff White, *The Growth of the Red Army*, Princeton University Press, Princeton, N. J., 1944.

¹⁶ Raymond L. Garthoff, *Soviet Military Doctrine*, The Free Press, Glencoe, Ill., 1953.

¹⁷ Stefan T. Possony, *A Century of Conflict: Communist Techniques of World Revolution*, Henry Regnery Co., Chicago, Ill., 1953.

¹⁸ T. A. Taracouzio, *War and Peace in Soviet Diplomacy*, The Macmillan Co., New York, 1940.

¹⁹ B. H. Liddell Hart, ed., *The Red Army*, Harcourt, Brace & Co., New York, 1956.

¹² *Ibid.*, pp. 515-516.

¹⁴ *Ibid.*, p. 525.

which pay obeisance to Lenin as one of the grand names in Soviet military doctrine. In the 1955 volume he shares billing with Stalin. In the 1956 book he has the stage almost to himself. (The change from Stalin to Lenin is, of course, political. Stalin is just as good, or as bad a military scientist as he ever was. And the quality of Lenin's work has not suddenly improved over 30 years after his death. This obvious fact should be kept in mind, if for no other reason, because the majority of Soviet planners now active are products of the age of Stalinism—not of Leninism.)

The 1955 volume of essays contains an article by Colonel I. Baz' entitled "Lenin i Voennaia Nauka" (Lenin and Military Science) while the 1956 volume contains an introductory editorial entitled "Za Glubokoe Izuchenie Voenno-Teoreticheskogo Naslediiia V. I. Lenina" (For a Profound Study of the Military-Theoretical Heritage of V. I. Lenin) and three articles specifically concerned with Lenin's concepts of military science.

A comparison of the contents of the two volumes indicates:

1. The vagaries of the game which interpreters of the Soviet scene must play if they attempt to engage in the Platonic cave contest of guessing which form will appear next.

2. The rhetorical level of doctrinal orthodoxy.

The 1955 volume reiterates the classic formulation on the inevitability of war. That inevitability must never be forgotten, says Colonel G. Fodorov, the holder of the degree of Master of Arts in Philosophy, because "only with the destruction of the last exploitative system—capitalism—will wars no longer be inevitable."²⁰

This and other repetitions of the inevitability of the war theme are coupled with assertions that "imperialist forces, led by

aggressive circles in the USA, are openly carrying on the preparation of war against the USSR and the countries of people's democracy."²¹

Parallel to this assertion there is much stress on the contention that the element of surprise in military doctrine, both bourgeois and Soviet, is of increasing importance.

In Soviet theory, according to Major General N. Pukhovskii, the principle of surprise always has been considered important as a temporarily operating factor of war; with the development of more efficient offensive military weapons,²² it has gained even greater importance, especially in the launching of war.²³

As for bourgeois military doctrine, a Colonel Vasilenko states:

*All bourgeois military doctrines are staked on surprise attacks which will give the aggressor a serious supplementary military advantage because the imperialistic power which takes on itself the initiative of aggression will itself select the most advantageous moment of attack.*²⁴

In spite of this professed danger of surprise attack against the country of victorious socialism, the essayists of the 1955 volume hold out Leninist promises of the inevitable triumph of a vigilant communism.²⁵

Agreement With Lenin

All of this is not divorced from Leninism. The inevitability of war theme, the necessity of vigilance in the face of imperialist adventurist plans, and the promise of eventual victory are, of course, the purest Leninism. Their translation into 1955 type language has not proved difficult.

Colonel Baz', who wrote the 1955 essay on Lenin and military science, is one of

²¹ *Ibid.*, p. 18.

²² *Ibid.*, p. 167.

²³ *Ibid.*, p. 100.

²⁴ *Ibid.*, p. 212.

²⁵ *Ibid.*, p. 107.

²⁰ *Marksizm-Leninizm o Voine, Armii i Voennoi Nauke: Chornik Statei, Voennoe Izdatel'stvo, Moscow, 1955, p. 30.*

the more active writers on the Soviet scene and his work has been largely in the field of doctrine and theory. He stresses Lenin's role in the building of the Soviet Army. "Lenin was the first of the Marxists," he says, "who, on a theoretical basis, showed the necessity of a true regular army in a socialist state. This was a great scientific feat."²⁶

Lenin's "science of victory" also is considered by Colonel Baz'. He finds that, in addition to the continuing importance of imaginative and forceful leadership, Lenin elaborated the following axioms on who wins:

1. Historically, that class will triumph which can carry the mass of the population with it.

2. That country will triumph where there is a unity of the people in the struggle with the enemy.

3. That side will be victorious where there are located popular masses who recognize that they are waging war for their own, for popular power—for the power of the working class.²⁷

"In the end," says Lenin by way of Colonel Baz', "victory in any war depends on the state of courage of those masses who shed their blood on the field of battle."

The opening editorial of the 1956 collection²⁸ states, "In the end, victory in any war depends on the state of courage of those masses who shed their blood on the field of battle."

The role of Lenin as a military thinker is somewhat more stressed in the 1956 volume than it was in 1955. "Lenin was the greatest strategist in the history of wars of working masses for their liberation from oppression," states Colonel Strovov in echo of the late peasant President M. I. Kalinin.²⁹ Lenin was the organizer of the Red Army, the decider of all questions of all aspects of military science and

logistics, and an authority on naval matters as well.³⁰

"The basic Leninist idea," the 1956 volume states, "is the idea, developed in connection with considerations of military art, of action, decisiveness, audacity, and aggressiveness in armed struggle." These ideas are pertinent in an epoch in which "war is no longer fatalistically inevitable" even though adventurist circles in Western imperialistic countries are plotting a new war." Vigilance is necessary. Vigilance coupled with confidence in the ultimate victory is the basis of contemporary military doctrine. There are calls for a reassessment of the importance of the opening stages of war and assertions, quoting Lenin, that "Military tactics depend on the level of military techniques." There are analyses stating that one weapon will not win wars but that all weapons and an integrated effort of all sides of society will bring victory.

Conclusion

War in this age will be horrible. The view of Lieutenant General Khrushchev holding Laika's empty leash has prompted many to conclude that "war has become obsolete." But let there be no doubt as to the Soviet ability to face the possibility of war in the nuclear age nor the outcome of world war III.

The Soviet view is contained in the following quotation from the 1956 volume. This statement was published after the death of Stalin, after the secret speech of Khrushchev, and long after the Geneva conference. It was published in the age of Soviet calls for peaceful coexistence and peaceful competition. It says:

*The result of a new world war, if it is unleashed by the imperialists, will not be the destruction of 'world civilization' but the destruction of the imperialistic social system.*³¹

²⁶ Ibid., p. 76.

²⁷ Ibid., pp. 84-85.

²⁸ *Marksiizm-Leninizm o Voine i Armii, op. cit.*

²⁹ Ibid., p. 57.

³⁰ Ibid., pp. 7-8, 56, 68.

³¹ Ibid., p. 55.

AUTOMATION AND THE PSYCHOLOGY OF LOGISTICS

Captain Carl M. Guelzo, *Transportation Corps*
Military Traffic Management Agency

THE civilian businessman is in a rather enviable position. Normally, he has complete confidence in his suppliers—or he finds a new source of raw materials. He enjoys the stability of a permanent mailing address and shipping point. And his fiscal, production, and sales managers combine to provide him with a definite schedule for the transportation of raw materials and finished products.

The exigencies of combat prevent the same degree of absolute assurance in supply, transportation, and requirements to the military commander, although past experience indicates that much of the success of the US Army in its wars was due to the ability of the Army to furnish adequate logistical support to its troops. In keeping abreast of technological developments, automating the processes of computing requirements, requisitioning, and—particularly—the transportation phase of logistics offers great promise in increasing the faith and confidence of the combat soldier in his system of supply support. The role of automation in logistics, consequently, is part physical and part psychological, for any system of supply, no matter how well-conceived, must enjoy the confidence of both its operators and its users.

The often unconscious uncertainty of the effectiveness of the logistical system has been demonstrated in virtually every war in which the Army has been engaged

through the Korean affair. The items which combat troops are willing to haul into the forward areas with them is an excellent index of the effectiveness of supply, first physically, by indicating what troops feel they do or do not need, and second psychologically, by indicating the degree of faith they place in the ability of the logistical system to supply them.

Considerable effort has been, and is being, expended to determine just what really may be deemed necessary in combat to the extent of inclusion in an equipment authorization table, as opposed to the "just-in-case" items. Quantitatively, mechanization—or, more correctly, automation—of the logistical system seems to offer the most promise of maintaining supply confidence at a high level if used intelligently.

Some problems, of course, almost defy solution. To the horror of experienced commanders, the steel helmet all too frequently has substituted for any number of modern amenities, not the least of which was as a washbasin. The three-legged, locally procured stool served nicely as a washstand and as a seat at outdoor movies, besides taking up valuable space in unit vehicles. Automation, of course, cannot bring the civilization of plumbing fixtures to the battlefield; but the wonders of electronics have introduced a new dimension into the process of logistics.

Reflecting possible use in a future com-

Automation in the processes of computing requirements, requisitioning, and transporting supplies offers tangible efficiency, economy, and assurance to the combat commander in logistical support of his operations

bat zone, the transceiver system is in current use in Europe, enabling the commander to make his wants known in a fraction of the time formerly consumed by voluminous paper requisitions. Logistics, however, has still another link to which automation has not yet been applied fully: the management and use of transportation services.

Transportation Aspects

The use of premium transportation is a partial answer to the problem of supplementing improved requisitioning and shipping procedures by placing the material into the supply pipeline in the required time. However, the use of high-speed, expensive means of transportation for critical items holds a danger that tends to increase the ever-important price tag to a point incommensurate with the benefits to be derived.

Expedited rail movements, fast highway freight, or air movements of supplies are expensive. The cost, to be sure, is justified in the movement of items which warrant the price of transportation: high value goods, scarce or controlled or regulated items, or supplies simply for which an immediate and urgent demand has arisen. Gasoline, for example, can be shipped quite cheaply by barge; but an armored thrust stalled for lack of fuel fully warrants the most expeditious transportation for the timely movement of the gasoline.

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In such instances, time is the primary consideration; cost is but secondary.

Premium transportation, however, must be used and used intensively lest idle facilities cause too deep an economic drain. The moment users are advised either formally or that the commander "desires" maximum utilization of costly transportation facilities, the system is transformed from a supply pipeline into a suction pump. Once a means of transportation begins to generate requirements instead of meeting them, the entire purpose of premium transportation has been defeated. As valuable as such expedited service may be, the use of rapid methods of transportation and requisitioning to conserve time in transit is but one aspect of the total problem.

Another purpose behind the use of premium modes of transportation, or such expedited procedures as may be found in the Modern Army Supply System (MASS), is to reduce the diameter of the flowing end of the horn of plenty of World War II that funneled supplies generously and profligately into combat areas overseas. MASS, in providing selective stockage based on customer demand and rapid transportation and communications, achieves a narrow pipeline of hose like flexibility which can be directed at will into areas of need or shortage and reduce supply stocks of reserve matériel and lower supply operating levels. This concept cannot be accepted, however, without some modification dictated both by the need for effective utilization of scarce transport facilities and by sheer economy.

Storage in Motion

Haunted by what may well have been the most gigantic traffic jam in history, which backed up rail cars during World War I from New York to Chicago, the transportation experts of World War II and Korea preached the doctrine that transport equipment must not be used for storage. This eminently practical thesis

bears one modification that has proved a fruitful source of dollar economies to commercial shippers. Rolling stock—rail cars, trucks, planes, or ships—must not be used as warehouses *if not in motion*.

Residents of the Knoxville, Tennessee, area are provided with frequent opportunities to see this modification in action. An interesting Sunday afternoon diversion is to make the pleasant trip to Fort Loudon Dam. If the time is selected judiciously, the visitor will see long barge tows of petroleum products passing through the locks bound upstream for Knoxville at the head of navigation on the Tennessee River. Water transportation is cheap, relatively speaking, but slow. The slowness, however, permits a most advantageous type of storage in transit, for the oil companies have so programed their requirements and shipments that the cheap water transportation can be used and still have the shipments arrive when needed.

A blending of the fire hose supply pipeline concept and this idea of storage in motion within CONUS may be coupled with automation to produce both the speed and economy required by modern combat tactics.

Late in 1953, Major General Edmund H. Leavey, a former Chief of Transportation, stated, "Without effective transportation all logistic efforts collapse." Transportation equipment still cannot be operated by remote control, but the management of the use of transport facilities, accelerated by the use of electronic computers, promises an efficient yet economical way to avoid the "collapse" of which General Leavey warned.

The North African invasion of World War II taught logisticians the bitter lesson that men could be moved with greater facility than their logistical support. Troops were diverted from England to North Africa with a comparative ease that belied the difficulties of diverting supporting supplies. The hit-and-run tactics

which promise to characterize the battlefield of the future mean that such slow-motion, elephantine diversions of supplies will be invitations to disaster. Supply destinations will change almost by the minute as the means of troop mobility improve, to the extent that the needed responses by the logistical system must approach the electronic in speed of reaction.

Electronic Traffic Management

The use of the supply pipeline within CONUS as a means of in-motion storage implies a degree of control virtually impossible without the use of computers. The machine—carrying in its memory banks the type of supplies, the quantity, and the routes being followed along the transportation system—provides more up to date information of the location of each shipment than is obtainable by other means of data compilation. The logistical operators, knowing what is in the pipeline and where such material is located, thus are able to manipulate their flexible, small-diameter hose to destinations which may even have been completely unknown when the supplies were first inserted into the system. The use of the pipeline as an intransit warehouse, as opposed to a mobile but motionless warehouse, thus conserves a further increment of the vital element of time in getting the supplies to ultimate destinations.

Theories, while often interesting, occasionally prove difficult to translate into practical, useful reality. A fundamental axiom of logistics well may be that complex questions require complex answers. The application of automation to the transportation phase of logistics, by the same token, often is far from obvious.

If the process of logistical support can be accelerated by using electronic computers, the problem of selecting the quickest and most economical routes over which supplies will be transported could be solved simply by feeding all available informa-

tion on routes, rates, and carriers into a machine and then pushing the proper buttons to get answers. Unfortunately, this would require approximately *two billion* items of information. The Armed Forces, as yet, are unable to afford a machine with a storage capacity of this magnitude. To reinforce the impracticality of this apparently "simple" solution is the fact that even if all routes were to be fed into a machine, over 70 percent within the United States would be used for military shipments only a *single time*.

Less obvious applications of automation to this management of military traffic, however, still promise important contributions to the system of logistics. The process of rapidly and accurately locating supplies in transit already has been cited as ideally suited to electronic methods. Since transportation requirements must be coupled with consumption requirements, the byproduct is data regarding logistical requirements far more accurate than that produced from the use of arbitrary formulae based on the often inapplicable experience of past wars. Where a requirement for the transportation of supplies exists, it follows logically that a measurable requirement for the supplies themselves also must exist. Thus is the demand for transportation services derived from the basic demand for the material itself. The computers also are able to run cost comparisons of both routes and rates which would be prohibitively time-consuming if performed manually.

One significant fact of transportation is that the shortest route is not necessarily the cheapest. The machine is able to make multiple routings between a diversity of shipping points and destinations by offsetting a more expeditious but higher cost routing in one segment of the transportation plan with a lower cost routing in some other segment. The resulting pattern combines timeliness of shipment with the lowest cost combination throughout

the entire transportation system and still considers the needs of the combat commander in time and quantity.

This use of automatic data processing systems (ADPS's) in speeding shipments over the most economical routes has yet another advantage not immediately apparent to the combat commander. The location of depots and transit storage points is facilitated from both a time and cost standpoint giving the overseas commander an invisible, but nonetheless, real further advantage in rendering zone of interior installations better able to meet his requirements.

Stoppages and Machine Failures

Any manual system, whether in supply, transportation, or personnel administration, may be slow and ponderous, but it does usually exhibit a most gratifying characteristic of being able to function under the most adverse conditions. A hand-carried requisition, for example, is not apt to go astray because of a faulty transistor, a poor job of welding in a delicate electrical connection, or a misprinted circuit. One source of suspicion of automation in logistics is founded on the fear that a system geared to automatic data processing may return to manual operation only with difficulty. The ADPS does not, however, contemplate a return to manual operation in the event of a machine failure.

Emergency planning for an ADPS is immensely simplified by one highly significant fact: The machines used in the traffic management aspects of logistics are standard models now in full production. Were these computers onetime, tailor-made creations of the electronic engineers, a considerable element of flexibility would be removed from the system. The fact that the models used in military logistics are readily available commercially removes much of the fear of lack of replacement equipment.

The system is geared to handle three

general categories of stoppages and machine failures:

1. *Momentary.*—Delays lasting from a few minutes to eight hours or one working shift. Since the machines are not programmed for a full 24-hour utilization, slippages in the workload caused by short delays can be absorbed with a negligible loss of working time and virtually no affect at all on the system simply by scheduling an extra shift.

2. *Temporary.*—Delays exceeding one working shift and lasting up to three days. Slippages up to several days also can be absorbed by scheduling extra working shifts with relatively slight losses in total working time. The system, conceivably, may be slowed to a certain extent, but would be functioning at full efficiency as soon as the extra shifts had cleared the backlog. The sensitivity which manufacturers display toward the bad publicity attendant on machine failures also helps considerably in repair work. Maintenance personnel supplied by the equipment manufacturers are quite prepared to work around the clock to get an inoperative machine back into full production. Even major damages can be repaired quickly by this "maximum effort" using replaceable integral components.

3. *Permanent.*—Complete stoppage resulting from either a protracted power failure or total destruction of the machine. The ease with which a computer can be completely replaced reduces the impact of total destruction on the entire automatic data processing system. Some disruption is to be expected should the stoppage endure beyond three days, but the system would by no means fall apart. Even a local power failure presents no insuperable obstacle to continued operation of the system itself as opposed to the functioning of an individual machine.

The workload of a machine may, quite easily, be transferred to other computers located in the vicinity or even hundreds

of miles distant. The scheduling of multiple shifts on these sister machines permits absorption of the work without affecting the efficiency of the system as a whole. The ease of repair, replacement, or transfer of workload makes auxiliary sources of power unnecessary should the stoppage be due to utility failures. In the event of widespread destruction which might prevent this network type of tie-in between and among machines, an alternative plan is the preparation of duplicate magnetic tapes containing data and operating instructions and programs which would be stored in an alternate location. By so doing, the work of any one machine could be performed by any other similar machine regardless of location simply by using these duplicate tapes. This vital element of flexibility of the entire system in both the ready replacement of inoperative equipment, or the absorption of additional workload by other machines, makes an ADPS difficult to destroy.

For the Future

These applications of automation to the transportation aspects of logistics are not things which could be or should be done, but are rapidly becoming tangible realities. Shortly, the Military Traffic Management Agency,* which provides traffic management services for the entire Defense Establishment under a Single Manager assignment, will have in operation an automatic data processing system capable of compiling information involving up to nine million shipments annually should around the clock operation become necessary. Much of the equipment is in being, the applications to military transportation and logistics are known and recognized, and the establishment of operating and functioning systems is rapidly approaching the implementation stage.

The use of punched cards on electric accounting machines (EAM's) has done

* See "A New Look in Military Traffic Management," Major General E. C. R. Lasher, *Military Review*, July 1957, p. 51.

much toward improving the efficiency of the logistical system. The computers to be used by the Armed Forces, however, will supplant the existing EAM systems and increase the amount, flexibility, and speed with which data can be handled. The use of automatic data processing systems will produce significant savings in management and work-simplification over the costs of an exclusively punched card operation designed to do the same jobs projected for the ADPS, not to mention the savings in time so vitally important to the field commander and in transportation costs so vitally important to the taxpayer.

Aside from the tangible efficiencies and

economies resulting from the use of automatic data processing systems in logistics, these electronic marvels serve to give an added element of assurance to the combat commander. No longer does he need to regard the system of supply with suspicion nor overrequisition "just to make sure." He does not need to fear the inability of the logisticians to follow his troop shifts, regardless of scale, with the necessary logistical support. His troops still may cherish the self-supplied items of comfort and civilization, but their combat support, more than ever before, is able to emulate Mary's little lamb and follow them wherever they may go.

I would like to see even more use made of the marvelous electronic computers available today. It seems to me that one principal reason why our scientific and technological progress today is so rapid is our increasing use of these computers. Up until their advent, progress was limited to the speed at which man's mind could proceed through the logical sequence of setting up a hypothesis, determining the experiments necessary to test it, carrying them out, and establishing the validity or falsity of the hypothesis. Today, we still use the same logical sequence of hypothesis, experimentation, and conclusion, but the process is speeded up, perhaps a millionfold, through the use of electronic computers. If, for example, we had no electronic computers at our Army Ballistic Missile Agency, we might still be trying to determine exactly what happened on last year's missile tests. With computers, this information is available to us almost immediately after conclusion of the test. In many cases, too, it is not even necessary to launch an actual missile to find the answer to a specific problem. Computers now available will simulate a missile flight under the desired conditions and come up with an answer in less than the elapsed time of an actual flight. In practically every field of science and technology today, electronic computers make it possible to telescope time. They also make it possible to lift the burden of time-consuming calculations from our scientists and engineers, and free their minds for truly creative effort.

I would like to see far more automation in our logistics and administrative systems, and in air defense and countermissile systems, such as *Missile Master* and *Nike Zeus*.

And particularly, I would like to see greater use of the module principle so that defective electronic components can be readily replaced under field conditions, or even under fire, by the soldier who uses the equipment.

Lieutenant General Arthur G. Trudeau

The FEBA, Limiting Point, and Progress

Major James G. Piper, *Infantry*

Student, U. S. Army Command and General Staff College

A NEW age has dawned. The old triangle has been replaced with a pentagon and a new language has been introduced to describe the phenomenon. Words have been added, map symbols have been subtly changed, and a different lexicon of abbreviations has been introduced. All this is necessary, so many would have us believe, in order to free our subconscious of the past and think of the Pentomic Division in new and imaginative terms worthy of its present role and of its larger, more powerful future.

This is a valid concept. It is unrealistic to train for the next war with the words and ideas of the last. We have a battle group. It isn't a battalion and it isn't a regiment and it isn't something in between. It is new. Accept it for what it is—do not try to turn it into something out of the past.

Examine Figure 1. Except perhaps for some of the frontages involved, there isn't a military man who does not recognize it. Some undoubtedly would change it but since this isn't a treatise on tactics, accept it as a defensive position. It fits the division, be it square, triangle, or pentagon.

Look at Figure 2. This, too, is recognized readily since the letters MLR (main line of resistance) form a mental picture and the infantryman starts putting in machineguns, laying minefields, sighting antitank guns, and computing dead spaces for his mortars. In short, by just adding a few letters from the past we have built

up the kind of defensive position that our experts say will never work again. It cannot hold and will not keep its men alive in world war III. Change the picture. Look at Figure 3.

To most of us the mere addition of new letters and abbreviations has little effect on realigning our thoughts from past methods to new and future concepts. We are mentally set to fight a battle group like something out of the past. Our tactics will be weak because they will not take full advantage of the organization or equipment. Somewhere along the line the term "forward edge of the battle area" (FEBA) has not been grasped.

Consider the following points:

1. Forward or rear or in-between, the battle area of today does not have an edge. And if it did it would be out somewhere ahead of the first screening line.

2. If we insist on naming a portion of the battle area, what happens to the rest of it? No one would seriously try to put a rear edge on the battle area. Why establish a front edge?

3. If we insist that the future battle area has a forward edge, in what way have we changed the MLR concept? Simply stating that a FEBA is an MLR with gaps seems to beg the issue.

What is the solution?

First, we are attempting to portray a defensive situation. What do we need? Basically, only two requirements exist: a division of ground responsibility and an

Although it is unrealistic to train for the next war with the words and ideas of the last, new organizations require more than new terminology in order to take the maximum advantage of their capabilities

indication of where the fighting should take place. This is what the present boundaries with their various limiting points are supposed to portray. Although they do accomplish this the manner in which it is done is the troublesome point.

The boundary is essential. All too often, however, the boundary is shown as a gracefully sweeping French curve that

times even correcting the mistakes of the originators. If that isn't imaginative enough, we admit that its location can be changed if those on both sides like some other point better. A permanent map symbol that does not represent something permanent on the ground is not realistic.

It is further unrealistic because of the manner in which it is used. It usually calls



haughtily ignore the terrain. But this is a matter of accuracy, not basic concept.

The limiting point is an entirely different matter. This imaginative and unrealistic symbol is a real villain. It is imaginative because it may be placed on a map by a staff officer who has never seen the ground, copied by a none too skilled and hurried draftsman, and reproduced on paper that often shrinks or slips—some-

times even correcting the mistakes of the originators. If that isn't imaginative enough, we admit that its location can be changed if those on both sides like some other point better. A permanent map symbol that does not represent something permanent on the ground is not realistic. It is further unrealistic because of the manner in which it is used. It usually calls for coordination at a point of ground which is not considered important enough actually to occupy and is either off to one side or considerably in advance of those positions which are that important. If this coordination is physical, it usually involves sending two patrols from opposite sides to a predetermined spot—a procedure that any patrol leader can vouch for as being fraught with dangerous possibilities. If

the coordination is by fire, any one point on the boundary becomes meaningless because the entire boundary from the extreme range of the largest weapon available to some undetermined location behind the position is the "limiting point." Designating a single point of coordination is just not realistic.

In addition, the limiting point instills

Returning to fundamentals, we have our defensive ground defined in width. How do we define it in depth? Turn to Figure 4 and you have an answer that is the antonym of the present limiting points. They, and their deficiencies, have been replaced by a series of defense centers.

Quite naturally, corps and army are not concerned with the same centers of re-

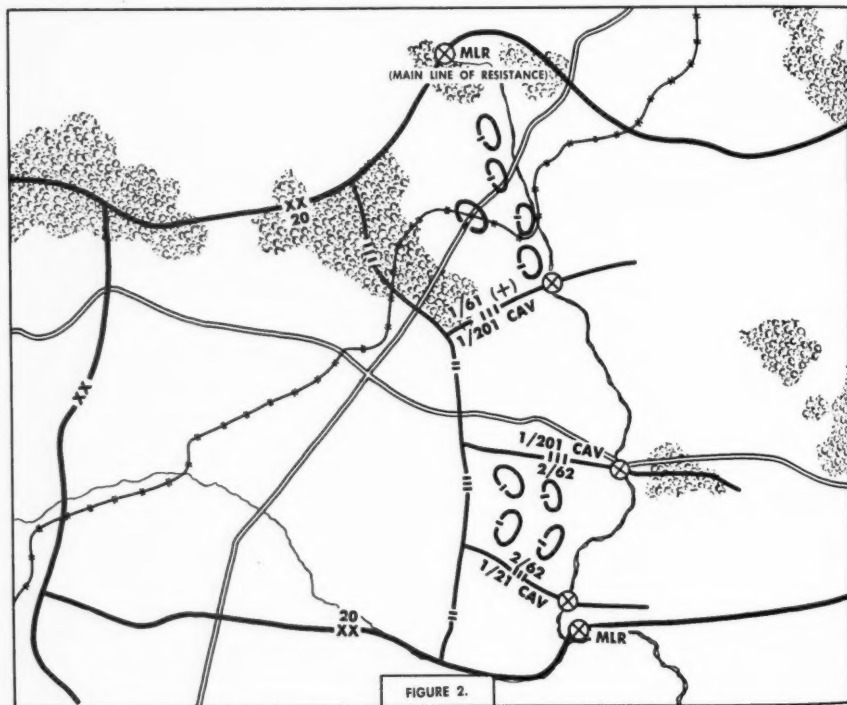


FIGURE 2.

a false sense of security at higher headquarters. Everything is safe because this element is tied in with that one at this point. It matters little that one company has to reach out 500 yards to do it (they already have a 1,500-yard front), or that the enemy comes through the limiting point just as though it did not exist. It is friendly blue in color and looks good on a situation map.

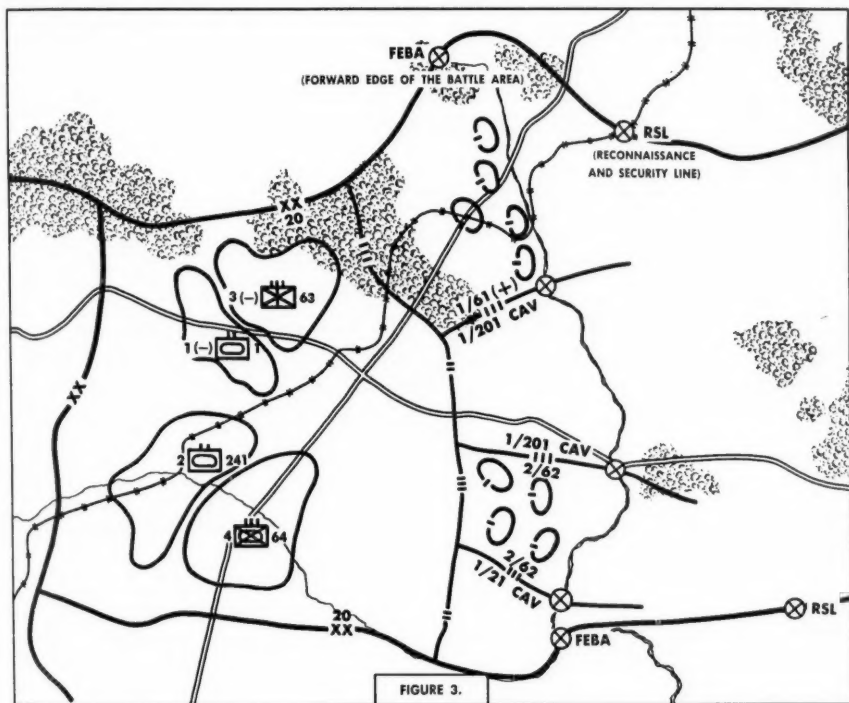
sistance as the battle group. The same line of reasoning is applicable for all echelons, but let us start with the division and its mission. When corps decides or is directed to establish a defensive position, it designates certain terrain that it considers important and tells its divisions where this terrain is by placing a division defense symbol on it. A division might be directed to defend several points but each one

would have to be important from the corps viewpoint.

The division knowing its own limitations and capabilities—to include strengths and logistics—and taking full cognizance of the terrain and enemy situation, adds defensive centers for its battle groups and other major elements. One of these may or may not coincide with the defen-

in with the adjacent units as he sees fit. He is limited only by his boundaries and his mission.

At this point it might be well to reassure those worried about alignment. No command echelon can designate a defense center too far forward or behind the adjacent centers without ensuring that the exposed unit is given sufficient reinforce-



sive center directed by corps. Certainly, close-in protection of this area must be provided. Division usually will designate at least one defense center in each committed battle group zone. There may be more than one. In a similar way the battle group selects the defensive centers for its companies and the company commanders select their platoon positions. Each commander organizes his ground and ties

ment to effect a reasonable juncture with the units on either flank. The point is that *how* and *where* are left to the two commanders concerned. At present, this probably means that battle group defense centers generally will be on a straight line across the front. As new weapons and means of surveillance and mobility become standard, more latitude in this requirement can be accepted. The defense

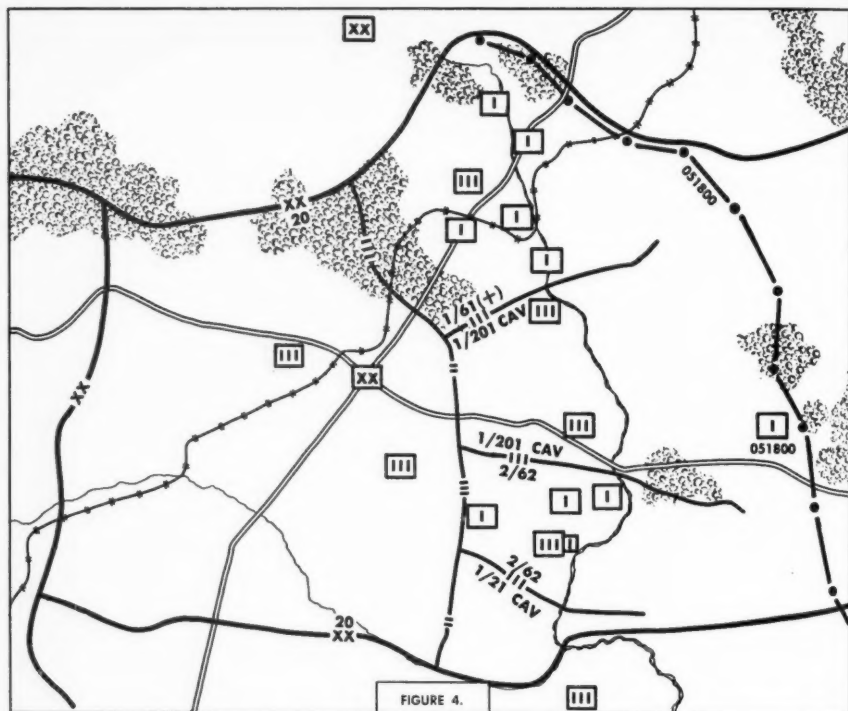


FIGURE 4.

center symbol is for the future as well as for the present.

Major James G. Piper was graduated from Indiana University and received his commission in 1943. During World War II he served in France, Belgium, and Germany with the 12th Infantry, 4th Division, and with the 19th Infantry, 24th Division in Japan. He was assigned to Supreme Command Allied Powers, Tokyo, for two years and upon his return to the United States served at Rutgers University on ROTC duty. In 1950 he went to Korea where he was with G4, Eighth US Army. Following his graduation from the Advanced Course of The Infantry School in 1953, he served with the Office, Deputy Chief of Staff for Logistics. A member of the 1957-58 Regular Course of the U. S. Army Command and General Staff College, he now is under orders for duty with US Army Europe.

In the position defense there would be many such designated centers at the lower echelons. In a mobile defense the designation of specified strong points is not as numerous. The mobile defense battle might take place around a particular critical piece of terrain, but the enemy should never be allowed possession of the higher units' designated defense center without specific authority. In some extremely fluid situations the lower echelons might not have any designated defensive centers. In this case a battle area is designated by the use of boundaries and, if necessary, phase lines.

What about those positions forward of what we mistakenly call the battle area? How can we designate those screening lines that prudence and commonsense dic-

tate we employ? In the first place, these forward positions, be they general outpost, combat outpost, or reconnaissance and security lines, are all temporary in nature. Therefore, show them by a series of dots. This is the accepted symbol for a screening line, why not use it? A time of holding could be added to the line or, in rare cases, a defensive center might be designated. However, a defensive center in a screening position could be abandoned any time after the designated time of holding without any specific permission factor being involved.

The use of the defensive center is not limited to the pure defense situation. It is readily applicable to all types of retrograde movements. Particularly good is its

ability to portray key bridges or passes that must be seized and held prior to the general withdrawal. It also is the clearest way of designating rear area security missions. The defensive center even has a place in the attack by indicating the corps objective as well as the division or battle group objective.

This is not a new idea, of course. It is just a way of depicting on a map what takes place on the ground and at the same time eliminates the FEBA and the limiting point as unnecessary appendages. It tends to end the MLR concept and allows us to get on with organizing a battle group defense unencumbered with leftover ideas of how to fight a battalion or regiment.

As is always true, improvements in weapons impose changes in tactics and in tactical organization. We carry out a continuous program of testing and analysis to determine alterations which should be made to our tactical doctrine. With reference to our organization, we have recently completed the conversion of all the divisions of the Active Army to the so-called Pentomic structure. . . . This type of division was designed to meet what we visualize the needs of modern war to be.

With all our improvements in weapons and organization, we must not lose sight of the unchanging fact that no matter how fine the weapons and equipment of any of our Armed Forces, the effectiveness with which they are used depends ultimately on the skill, the intelligence, the courage, and the dedication of the men who use them.

General Lyman L. Lemnitzer

PETER THE GREAT AND MODERN RUSSIAN STRATEGY

Colonel Charles H. Dayhoff, Jr., *Armor*
Faculty, US Army War College

TODAY, we hear much of Soviet strategy, objectives, policies, and intentions. There are those who contend that the present Soviet attitude toward the world is of recent development; others contend that the present approach has roots deep in Russian history.

Two hundred and thirty-three years ago, Peter the Great (1682-1725), the man who brought Russia from the East to the West, died and passed on a new Russia to his successors. Peter is remembered well, and many things are credited to him; but it is questionable how many of us in the West are familiar with what is reputed to be his pattern for Russian domination of the world.

His so-called "will and last testament," discovered during the reign of Catherine the Great (1762-96), interestingly reflects what appears today to outline many aspects of the over-all strategy of the Soviets. Whether the "will" is genuine or completely accurate really does not matter, for the approaches outlined in it and the time of its discovery in the 18th century clearly indicate that Russian dreams of domination are not solely developments of our present century.

Russia Under Peter

Under Peter, Russia became great and Russia became powerful. Much of the veil

of mysticism was removed. Western customs were introduced and the Russian frontiers expanded toward the West. It was Peter who realized that his country was backward and uncivilized, and too much like Asia. To gain firsthand knowledge of the West, Peter visited England, Germany, and Holland, even disguising himself as a commoner in Holland to learn shipbuilding. To assure control of developments in his country, the young czar established himself in a truly autocratic position by abolishing parliament, establishing and commanding a powerful army, and assuming control of the Church.

If Russia were to become a commercial country, rich and powerful, she needed seaports, and Peter was willing to fight for them. To the west lay the Baltic controlled by Sweden, and to the south the Black Sea controlled by Turkey. Against Sweden Peter succeeded in seizing land on the eastern side of the Baltic. Here, at what is now Leningrad, he built a new capital—"a window to the West." Against Turkey, however, he was not successful, and it was not until the reign of Catherine * that Russia spread toward the north shore of the Black Sea and the Crimea.

* Catherine was a German princess who became Empress upon the removal of her Russian husband, Peter II. Catherine is best remembered for her part in the Partitions of Poland in 1772, 1793, and 1795.

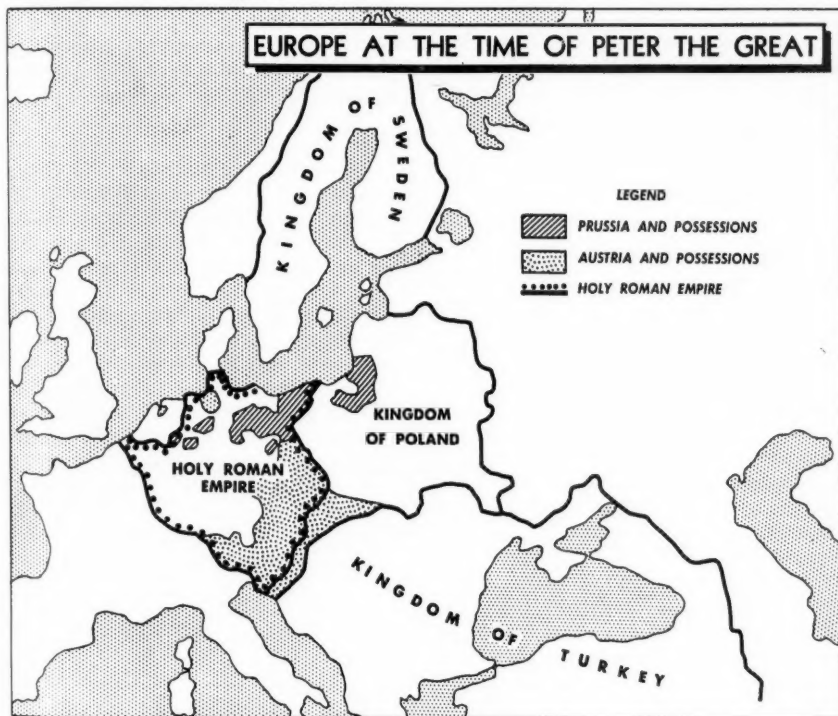
The Russian concept of world domination is not new. Similar plans were developed more than 200 years ago by Peter the Great who gave his successors a vivid blueprint for Soviet control of the entire world

Guidelines

A study of Peter's "will" brings to light many interesting guidelines for his successors. First, he gave credit to the "All-Powerful to whom we owe our existence, makes us regard the Russian people which is constantly guided by his light, and sustained by his divine support, as called in

Russia a great sea "destined to fertilize impoverished Europe." He further stated that if his followers "know how to direct the waters, her waves will break through any opposing banks."

Peter then proceeded to give his followers a series of instructions for their constant observation. An examination of



the future to be the dominant race in Europe." Peter looked upon Europe as approaching a state of decay and thus easy prey "for a young and new people, when the latter shall have attained all their force and power."

Peter regarded the invasion of the western and oriental nations by a force "from the North" as being further ordained by Providence. He likened Russia to a great river, and charged his descendants to make

these instructions reveals a very formidable pattern for world domination.

Pattern for Domination

First, Peter pointed out that Russia must be kept in a state of readiness for war. He urged that the soldier be ever ready and never be given rest except "for the purpose of recovering the finances of the country and the improvement of the Army." Further, he advised that they

must choose the most favorable moment for attack and always be ready to follow war by peace and peace by war all in "the interest, aggrandizement, and growing prosperity of Russia."

Peter proposed that every effort be made to secure the services from "the cleverest people of Europe—officers during war and savants during peace—in order to improve the Russians at the expense of other nations without losing her own advantages."

With regard to discussions on and affairs in Europe, he enjoined his followers to take every opportunity for participation, especially in "those concerning Germany, who as our most intimate neighbor interests us more directly."

Poland was to be divided, and continued disorder and jealousy were to be maintained. Russia was "to gain influence over the Polish assemblies and corrupt them, so as to obtain an interest in the election of kings, to name partisans and protect them as an excuse for the entry of Muscovite troops there, to remain until the day arrives for a permanent occupation."

If other countries objected to this, Peter had a ready answer. He suggested that these countries be tranquilized "by dividing the country until we can retake as

much of it as we have given up to them."

Scandinavia was not overlooked. Here, Peter proposed that as much of Sweden as possible be taken and that she be goaded into an attack against Russia so that there would be a ready reason for subjugation. An aid in this matter would be the isolation of Denmark from Sweden and the fostering of rivalry between these two neighbors.

Germany was to be used to increase Russian influence and to ensure this support, "German princesses were to be chosen for Russian princes to promote family alliances [and] to reunite our interests."

Russia was to seek an alliance with England for commerce. England, he said, "has the greatest need for us for her marine, while at the same time she can be most useful to us for the development of our own." To further Russian interests in navigation and commerce, relations between the two countries were to be developed, Russian products were to be exchanged for British gold, and relationships between British and Russian sailors were to be fostered.

Further Plans

Increasing expansion of Russian territory was to be made "towards the North along the Baltic, and also towards the South along the Black Sea."

Looking southward Peter advocated an approach "as near as possible to Constantinople and India." He said that whoever governs there will be the true sovereign of the world. To achieve these ends Peter advocated that the Russians "excite continual wars, not only in Turkey but in Persia." Dockyards were to be built on the Black Sea, and small pieces of land near the Black Sea as well as near the Baltic were to be seized as necessary to further Russian aspirations.

As Persia disintegrated, Peter exhorted his followers to "penetrate as far as the

Colonel Charles H. Dayhuff, Jr., was graduated from the Virginia Military Institute in 1931. He also holds an M. A. degree from George Washington University and is a graduate of the Armed School, the Armed Forces Staff College, and the British Imperial Defense College. During World War II he served principally in intelligence assignments in the South Atlantic. Other assignments include duty as Assistant G3, Caribbean Defense Command (Military Missions); 756th Tank Battalion; 3d Armored Cavalry Regiment; Army Advisory Staff, Naval War College; and as Chief, Training Division, Office of the Assistant Chief of Staff for Intelligence. Prior to assuming his present duties as Chairman, Faculty Group II, US Army War College, he was Assistant Director of Intelligence, The Joint Staff, Washington.

Persian Gulf, reestablish if it is possible the ancient commerce with the Levant, advance as far as India, which is the depot of the world. Arrived at this point, we shall have no longer need of England's gold."

At the time, Peter felt that Austria was

he proposed that the Russians exercise over Austria a "species of protection which may prepare for future domination."

Austria was to be interested in driving the Turks out of Europe, to neutralize her jealousies at the moment of the conquest of Constantinople, either by exciting her



a key to Russian expansion. He urged that the alliance with Austria be maintained carefully and that Russia "appear to support her in her policy of future domination in Germany." Here, again, jealousy among the princes was to be fostered, and efforts were to be made to have Austria demand the assistance of Russia. Finally,

to war with the great powers of Europe, or by giving her a portion of the conquest, "which we will retake from her at a later period."

Peter then went on to say that "with Sweden dismembered, Persia subjugated, Poland crushed, Turkey conquered, our army reunited, the Black Sea and Baltic

guarded by our ships, we must then propose separately, and very secretly, first to the Court of Versailles, then to that of Vienna, to share with them the empire of the universe."

Austria and France

Calculating coldly, Peter speculated that if one of them accepted the offer (and he felt that such would be the course "by flattering her ambition and national vanity"), then Russia should "make use of her for crushing the other." As a final point, Russia then would annihilate the one remaining. This, he felt, would not be too dangerous, since by now Russia would possess all the eastern part of Europe.

Of course, the wily Peter did not end on this note. Realizing that it was possible that neither France nor Austria would grab the bait, he pointed out that a means must be found for starting a quarrel between these two countries to ensure their weakening themselves.

At the same time, the Russian strategy would be to advance the Russian Army on Germany at the decisive moment. Concurrently, two fleets, "one starting from the Sea of Azov and the other from Archangel with Asiatic troops," would assist the Red Army by advancing through the Mediterranean and the ocean. Thus France would be invaded on one side, and Germany on the other.

Peter ended his blueprint of Russian expansion by concluding that with "these two countries conquered the rest of Europe will pass easily and without striking a blow beneath the yoke. It is thus that we can, and we ought to, subjugate Europe."

To visualize Peter's aims more clearly one need only to look at the map of Europe in Peter's time and that of Europe today.

During Peter's reign the three countries

which were contiguous to Russia were Sweden, Poland, and Turkey. Austria and the Holy Roman Empire occupied the center spots. The German states were small and to the west but lay along the coveted Baltic. Poland and Turkey both extended far to the west, with Turkey covering all of the southern part of Europe as far west as the Adriatic and encompassing the Black Sea and its outlets as well.

During the intervening years many changes have taken place in the map of Europe. Today's charts show an "independent" Finland occupying the eastern edge of what was once the Swedish Empire. Poland is vastly reduced in size and under Russian domination. Germany is divided and stands in a key position. The once vast Austrian Empire is reduced to a small neutral state. Albania, Yugoslavia, Greece, Bulgaria, and Romania occupy prominent positions in what was once Turkey. Turkey occupies only a small section of European Thrace, and Russia has spread through the Crimea and occupies the northern edge of the Black Sea.

Conclusion

Not only does Russia continue to develop her power and her modernity, but her control of vital areas envisioned in Peter's "will" are looming large in modern Soviet strategy. Persia continues under the name of Iran, but Russian tentacles are moving in and around the Middle East and the Persian Gulf. Although we may not be able to credit Peter with all of these visions for Russia, we can see readily that he gave his successors a vivid blueprint for world domination. It is interesting to speculate what Peter's design would have been for our part of the world, had the United States existed at that time. Interesting, too, would have been his thoughts for a rapidly growing Asia, which, like Russia in Peter's day, now has opened its eyes toward the West.

KEEPING PACE WITH THE FUTURE--

Air Mobility for Army Forces

Colonel Robert E. McMahon, *Infantry*
Faculty, U. S. Army Command and General Staff College

I would say that the rapid pace of modern military technology which has resulted in vastly extended ranges for modern weapons systems with tremendous destructive power, has magnified the need for better mobility throughout the entire structure of the Army.

—General Maxwell D. Taylor
Chief of Staff, US Army

This is the ninth in a series of articles expanding various aspects of "USA Command and General Staff College Keeps Pace With the Future," written by Major General Lionel C. McGarr, USA, Commandant of the College, and published in the April 1957 issue of the MILITARY REVIEW.
—Editor.

IN KEEPING with the "rapid pace of modern military technology," a basic tenet of the U. S. Army Command and General Staff College is the formulation and incorporation of realistic and forward-looking concepts, in both instruction and doctrine, through individual and collective organized thinking. The College is organized to accomplish this purpose. This article will discuss the organization, mission, and responsibilities of the Department of Airborne Operations and Army Aviation (DAA) and its related role in furthering the professional education of the student and assisting him in keeping pace with modern military technology in peace and war.

"The need for better mobility" is a pri-

mary precept of DAA and is a continual source of motivation in seeking to achieve the maximum in air mobility in our modern Army. The creation of a greater understanding by all students of the expanding capabilities and potentialities of air mobility keynotes this department's instructional effort. The student is also made aware of the practical limitations of air mobility means as influenced by the shortcomings of equipment, weather, and enemy capabilities. Coordination is effected with all other departments in order to assist them in emphasizing in their instruction strategic and tactical air mobility, both in combat movements and in logistic support.

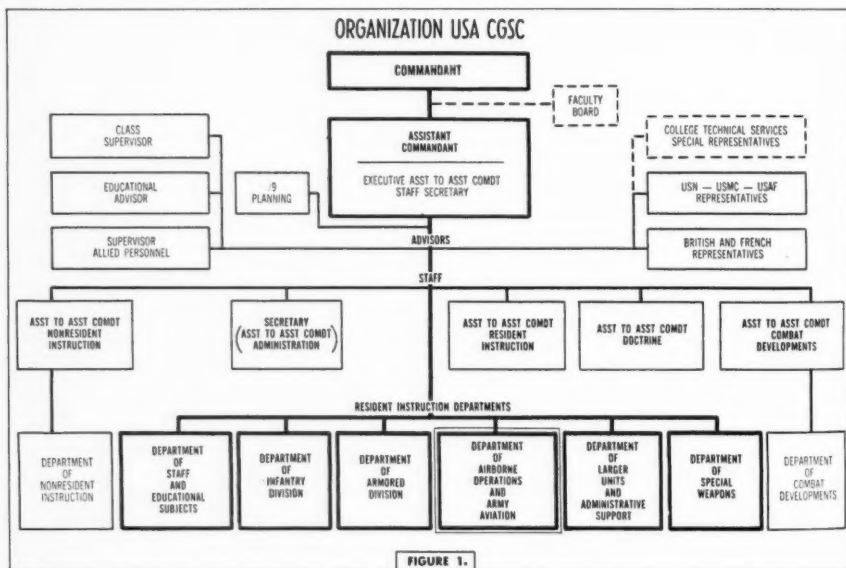
Air mobility facilitates application of combat power at the proper time and at the point or area of decision; our modern Pentomic Army must be trained at all echelons to exploit this important means. Air mobile operations, in conjunction with ground operations, have added new dimensions to the battlefield, and air vehicles, as a means of transportation, have reduced the impact of the traditional factors of time, space, and geographical ob-

The creation of a greater understanding of the expanding capabilities and the potentialities of air mobility plays an important part in the over-all College mission of developing commanders and staff officers

stacles. The USA CGSC student of today is the combat leader of tomorrow and must learn to think of air mobility and air vehicles as responsive instruments to be skillfully and habitually employed on the battlefield of the future. He must view the employment of air vehicles as a commonplace means to achieve greater flexibility and maneuverability on the modern battlefield, much as his predecessors used ground vehicles primarily to obtain decisive maneuverability on the battlefields of the

areas of coverage include the airborne division and airborne corps; air-landed operations of the infantry division, Army aviation, and unconventional warfare to include the administrative support aspects. The department, in addition, is responsible for the development and improvement of doctrine in these three important fields within the College areas of responsibility.

Airborne operations, Army aviation, and unconventional warfare are integrated with and emphasized in tactical and ad-



past. Let us now trace the manner in which this theme is implanted in the College curriculum.

Department of Airborne Operations and Army Aviation

Mission

The mission of this department is to develop a course of study which provides the student with experience in military problem solving and making and executing decisions in airborne operations, Army aviation, and unconventional warfare. The

administrative support instruction in the courses of study of all other instructional departments of the College.

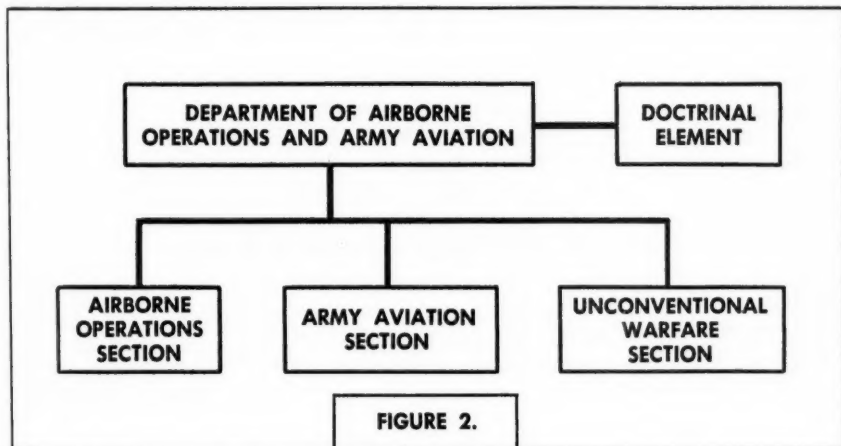
Organization

The organization of a Department of Airborne Operations and Army Aviation was announced by the Commandant on 4 December 1956 as a part of the reorganization of the College. This action brought together within one department the responsibility for and capability of developing a major course of study which would

permit energetic pursuit of the concepts of air mobility. It also assured clear-cut responsibility and unity of instructional and doctrinal relationships in this field. Instruction in unconventional warfare was also assigned to the course of study to be planned, prepared, and presented by this department.

The separate department for air mobility recognized in fact and principle the expanding importance of this activity in combat, combat support, and administrative operations. The College reorganization thus recognized a department for the air-

could be prepared for each of the instructional fields and the internal structure of the department supported this functional approach. Additionally, the sectional organization of the department further defining responsibilities permits efficient utilization of personnel and greater facility for contact, and coordination by authorized instructors of other departments in obtaining guidance in the preparation of their own subjects. A knowledgeable and experienced representative from each section is assigned to the department's Doctrinal Element which is discussed under



borne division paralleling the organization of separate departments for the infantry and armored divisions. (See Figure 1.)

The functional approach in organization was extended by this department in the organization of its component sections. In the *Commandant's Annual Curriculum Guidance and Decisions* of November 1957 for the 1958-59 curriculum, the increasing importance of unconventional warfare in the future was recognized. In order to ensure proper emphasis in this area an unconventional warfare section was formed. Thus subcourses of study

the "Doctrinal Activities." (See Figure 2.)

The relation of the DAA course of study and its position in the over-all curriculum is as shown in the shaded area of Figure 3, USA CGSC Curriculum Pyramid.¹

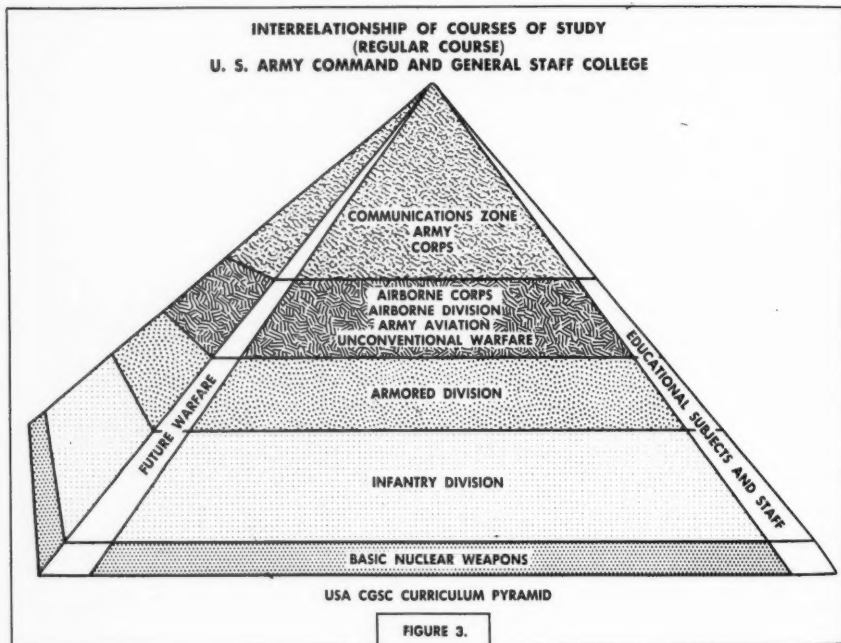
Planning, Preparation, and Presentation of Instruction

The /9 (1958-59) department course of study is composed of three elements: Airborne Operations, Army Aviation, and Unconventional Warfare. The course of

¹ "Keeping Pace With the Future—Molding the Staff," Colonel Walter M. Vann, *Military Review*, May 1958.

study is based on planning guidance promulgated in the *Commandant's 19 Curriculum Guidance and Decisions on the 19 Curriculum*, and on guidelines furnished by the Assistant to the Assistant Commandant for Resident Instruction. This planning guidance includes primarily the allocation of hours, the purpose of each subcourse of study, the progressive phases of instruction within each subject area,²

These proposed College Directives were developed after a detailed analysis of the 1957-58 course of study. Each subject taught was critically studied, both from the viewpoint of proper instructional and doctrinal coverage as well as from the student's reaction in the classroom and at periodic department-student conferences. Thus the proposed directives (which include in general the number of hours,



the forms of war, the levels of use of nuclear weapons, and the geographical locales.³

This planning guidance was used by DAA as a basis for preparing its proposed College Directives, which formed the basis for the 1958-59 formal program of instruction.

² "Keeping Pace With the Future—Armor's Role on the Atomic Team," Colonel Maxwell A. Tincher, *Military Review*, June 1958.

³ "Keeping Pace With the Future—Resident Instruction at USA CGSC," Colonel James L. Frink, Jr., *Military Review*, February 1958.

scope of instruction, methods of instruction, scale of use of atomics, and geographical locales) established the necessary College parameters for each subject in the course of study.

In the preparation of the College Directives coordination was effected between DAA and the other instructional departments, and close association was maintained with the Assistant to the Assistant Commandant for Resident Instruction

through his liaison officer to the department. Concurrently, each subject was coordinated with the Assistant to the Assistant Commandant for Doctrine⁴ in order to ensure portrayal of suitable and realistic strategic settings.

Based on these College Directives, the Director, DAA, conducted a briefing of the Faculty Board wherein each subject was reviewed and analyzed. Subsequent to this briefing and after essential changes were made in the department's course of study, the Commandant approved the College Directives. The combination of the Commandant's Annual Guidance, the Assistant to the Assistant Commandant for Resident Instruction guidelines, and coordination with the Assistant to the Assistant Commandant for Doctrine provided a series of checks and balances within the College to ensure a well-coordinated and comprehensive course of study. After approval of the College Directives, the department prepared and issued its directives which became the basic guide for authors in the preparation of their units of instruction.

At the present time, authors are preparing subjects which will be presented in the 1958-59 curriculum. These subjects, with the exception of an expanded cover-

age in unconventional warfare, will be primarily a refinement and improvement of the 1957-58 course.

The cycle of preparing and processing a unit of instruction involves the following phases: author guidance, author research and study, preliminary review, preparation and coordination, review, printing, presentation, and after-action analysis. This process of development is illustrated in Figure 4.

DAA, as the proponent department for air mobility and unconventional warfare, acts in an advisory capacity to the other instructional departments in these areas and assists the staff in monitoring the application of this type instruction by all departments. To promote uniformity and provide expert advice to the other departments, DAA prepared necessary guidance papers in five fundamental areas: Army aviation, unconventional warfare, anti-guerrilla operations, antiairborne operations, and the Strategic Army Strike Force. These subjects are discussed later in this article. These papers, in addition to basic guidance, set forth the over-all approach which should be taken by the departments in presenting instruction in the subject areas, and suggested ways and means to integrate these subjects effectively into their course of study.

In order to measure the student's progress and to evaluate the effectiveness of USA CGSC program of instruction, as well as to provide additional instruction in individual decision making, examinations become a necessary part of the curriculum. The examinations are based on instructional material covered in study assignments and in the classroom. The preparation of examinations is similar to the preparation of other subjects; however, they are subjected to special review noted below. For example, examinations are tested for clarity by a solving committee, composed of selected members of the faculty, and any questionable areas

⁴ "Keeping Pace With the Future—Development of Doctrine at USA CGSC," Colonels Victor W. Hobson, Jr., and Oliver G. Kinney, *Military Review*, November 1957.

Colonel Robert E. McMahon was graduated from the United States Military Academy in 1939; the U. S. Army Command and General Staff College in 1951; and the Army War College in 1955. During World War II he was assigned to the 517th Regimental Combat Team, serving in the capacity of battalion executive officer and battalion commander. Other assignments include duty with the 13th, 82d, and 11th Airborne Divisions; Office of The Inspector General, Department of the Army; and as Military Advisor to the Turkish Military Academy. In 1957 he was assigned to the faculty, USA CGSC, and now is Director of the Department of Airborne Operations and Army Aviation.

SUBJECT DEVELOPMENT

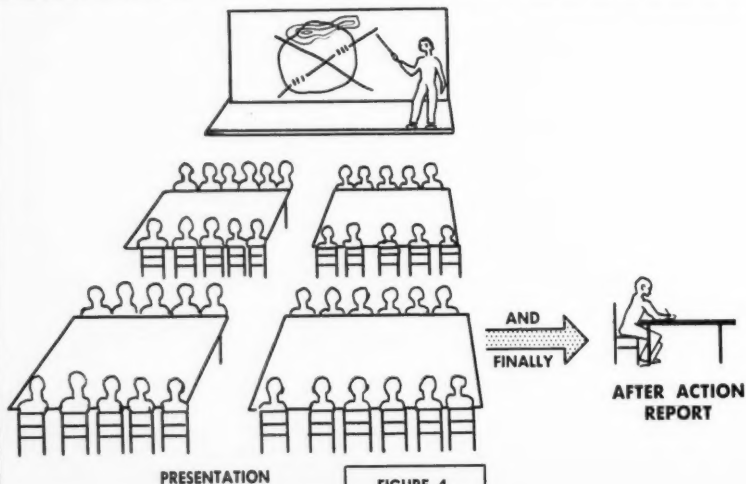
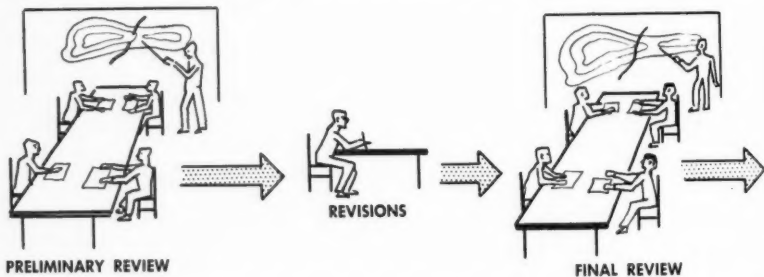
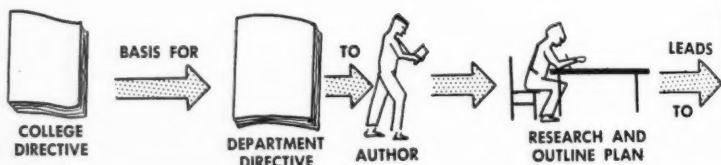


FIGURE 4.

are resolved. After the examination has received approval by the Department Director, it is revised, analyzed, and, when necessary, corrected by the Assistant to the Assistant Commandant for Resident Instruction. After receipt of a copy of the examination, the author, accompanied by the Assistant to the Assistant Commandant for Resident Instruction, briefs the Assistant Commandant and the Commandant prior to approval. As responsibility for review of units of instruction is decentralized to the instructional departments, the above review coupled with the Faculty Board review of the doctrinal basis for instructors ensures required College level control.

The department supplements its instruction by inviting prominent guest speakers, as part of the over-all College guest speaker program, to discuss topics related to the department course of study. These speakers provide stimulating ideas from outside agencies and institutions. Question periods after each speaker's formal presentation permit exchange of ideas between the speaker and the student.

Doctrinal Activities

The Department of Airborne Operations and Army Aviation, in addition to the responsibility for preparing and presenting instruction, has an equal responsibility, under College control and direction, for formulating, revising, and developing doctrine, including joint doctrine. The department is responsible for doctrine in the fields of airborne operations, Army aviation, and unconventional warfare. The department also reviews, evaluates, and coordinates doctrine developed by other services and other Army agencies as directed.

DAA's course of study is based on Department of the Army or US CONARC approved doctrine such as DA field manuals, training circulars, and US CONARC training texts. In view of the require-

ment for doctrine to keep pace with the atomic age, there are areas wherein new doctrine has not yet received final approval by higher headquarters. In this case the College is permitted by US CONARC to use College recommended doctrine, or new concepts identified as such. Otherwise all instruction is based on DA and US CONARC approved doctrine.

The responsibility for revising and developing doctrine is vested in the department's Doctrinal Element and the author-instructor.

The Doctrinal Element of DAA is composed of four officers assigned full-time doctrinal duties. One of these officers, acting directly under the Department Director, is the department's doctrinal point of contact with the Assistant to the Assistant Commandant for Doctrine and other College agencies. The other three officers are assigned as doctrinal representatives for airborne operations, Army aviation, and unconventional warfare. It is the mission of a doctrinal officer, assisted by other department members, to review all doctrinal papers in his related field prepared within the College and those submitted to the College for comment by outside agencies. Additionally, doctrinal officers prepare training literature covering their specific field such as Field Manual 57-100, *The Airborne Division*, Field Manual 57-30, *Airborne Operations*, and those chapters in the new Field Manual 100-5, *Field Service Regulations Operations* covering airborne operations and unconventional warfare. Inasmuch as these doctrinal officers are members of DAA, there exists a close and continuous intra-departmental relationship between the author-instructors and doctrinal officers.

The author-instructor contributes in a large part to the formulation of doctrine as many ideas are developed in detail during the preparation of a unit of instruction. The student body, representing all arms and services, also contributes new

ideas for evaluation and analysis by the faculty.

In performing its instructional mission, the department ensures student understanding of the most advanced doctrine and the experience and theory from which it was evolved. Emphasis in problem solving by students is placed on reasoning in the application of doctrine and other pertinent facts and considerations, and not upon doctrine as an end in itself. Instruction is designed to show that techniques and methods of operation can be modified and adjusted to meet the circumstances of a particular situation.

The department maintains close liaison with the Assistant to the Assistant Commandant for Doctrine to ensure coordinated and integrated effort on the instructional/doctrinal aspects of this department's activities. In furtherance of doctrinal activities, close liaison is also maintained with the other service schools and combat organizations concerned with airborne operations, Army aviation, and unconventional warfare, including The Infantry School at Fort Benning, the Army Aviation School at Fort Rucker, the Special Warfare School at Fort Bragg, the XVIII Airborne Corps, and the Airborne Divisions. This frequent exchange of information and ideas is an important source of coordinated and advanced thinking.

Airborne Operations

The knowledge of the existence of a well-trained airborne army, capable of moving anywhere on the globe on short notice, available to an international security body such as the United Nations, is our best guarantee of lasting peace.

—Lieutenant General James M. Gavin

Airborne and air mobility operations have added new dimensions to the battlefield. The modern aircraft and techniques for their employment permit the rapid

movement of combat power to and within the battlefield with minimum regard to terrain barriers and trafficability. This mobility provides some of the vast increase in maneuverability required to complement the increase in fire capability provided by nuclear weapons. It is apparent that as new types of air vehicles become available in quantity, airborne and air mobility operations will assume greater importance. The successful commander of tomorrow will be the one who does not let his operations become stereotyped, but who employs his air-mobile forces aggressively either independently or in conjunction with his ground maneuver elements.

The airborne subcourse is designed to develop fully the student's understanding and skill in the employment of airborne forces. Emphasis is placed on:

Basic organization and operation of the Airborne Division (ROTAD) and Airborne Corps Operations.

Employment of the air-landed Infantry Division (ROCID).

Administrative support fundamentals required for planning and executing airborne operations, including aerial resupply.

Advanced applicatory strategic and tactical problems under varied forms of war and operational environments.

Future aspects of airborne operations.

Antiairborne operations.

Each subject is designed to develop specific operational concepts. In the familiarization phase of instruction, the student learns staff procedures and techniques, and the tactical and logistical principles involving the employment of the airborne division (ROTAD) and the airborne corps. Emphasis is focused on the important administrative support required to launch and support an airborne operation. The Division Logistic Operations Center (DLOC) of the Support Group of the (ROTAD) airborne division

is employed in a variety of combat situations. The capabilities, limitations, and coordination necessary for carrying out missions in conjunction with the infantry division (ROCID) and the armored division (ROCAD) are covered in detail. This year the department prepared a problem illustrating the organization and employment of a type Strategic Army Strike Force. It is a strategic force held in a high state of readiness for immediate employment in a situation short of war, a limited war, or supporting our own forces or allies in a general war. This initial coverage of the Strategic Army Strike Force provides the student with a firm foundation for progressing to the applied phases of instruction, not only in airborne operations, as such, but throughout the balance of the curriculum. This problem will be further developed and emphasized for /9.

In the application phase the student solves basic tactical and logistical problems based on the principles previously learned. Later in the course, in advanced application, and acting as a commander or general staff officer, he applies himself in a variety of operational environments involving complex tactical and administrative problems.

One of the most interesting subjects of the Airborne Operations subcourse of study deals with airborne raids. *Airborne Division (ROTAD) in a Strategic Raid in a General Atomic War*, is selected for discussion because of its integrated employment of joint airborne forces, Army aviation, and guerrilla forces. Student experience and ingenuity are utilized to the maximum by tapping the new ideas emerging from open, objective discussion and those incorporated in student doctrinal papers on airborne raids. These papers receive careful analysis by the department and contribute to the energetic search for improved doctrine.

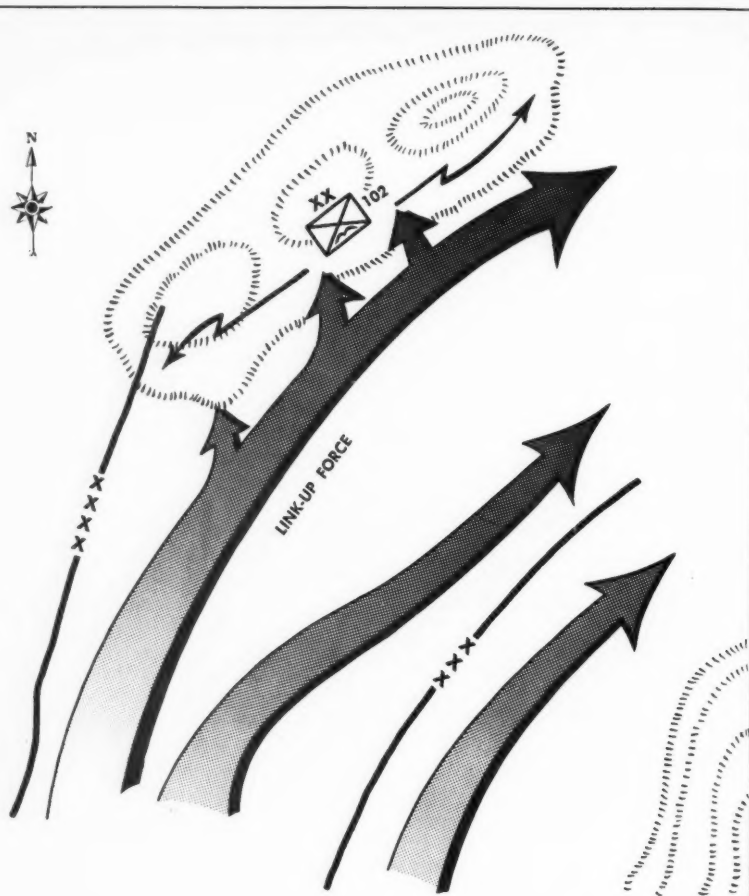
The capability of the airborne division

(ROTAD) to participate in frequent airborne assaults in support of other operations, employing Army and Air Force aircraft, is illustrated in a unit of instruction entitled *Airborne Division (ROTAD) in Dispersed and Successive Airborne Assaults in a General War*. Doctrine developed during the preparation of this subject is incorporated into the draft field manuals on the airborne division and airborne operations currently being prepared by this department. The timeliness and soundness is highlighted by the application of its doctrinal principles in the recent field exercise *Eagle Wing*, conducted by the 101st Airborne Division at Fort Campbell, Kentucky. Illustrated uses of this concept are contained in Figure 5 and Figure 6.

Another subject portrays the employment of an airborne corps in an airborne operation of long duration. This emphasizes the importance of administrative support including the use of air lines of communication in this type operation for an extended period of time.

The impact of future developments and advanced doctrine on military operations must be a continuing consideration. An interesting approach to future war instruction has been incorporated into the airborne subcourse. Using a previous subject involving airborne division operations in the current timeframe, the student replays the situation using new equipment which will be available during the July 1962-67 period. This permits the student to work with a new organizational structure and concept of employment based upon future equipment availability and trends.

As mentioned previously, there must be a close relationship between doctrine and instruction. The development of the instructional units has provided a number of new doctrinal ideas which will be incorporated into the 1958-59 curriculum.



THE MISSION OF THE 102D AIRBORNE DIVISION IS TO BLOCK AGGRESSOR ESCAPE ROUTES TO THE NORTHWEST AND PREVENT AGGRESSOR REINFORCEMENT FROM THIS DIRECTION UNTIL ADVANCING FRIENDLY FORCES EFFECT A LINKUP. AFTER LINKUP, THE 102D AIRBORNE DIVISION WILL CONDUCT ADDITIONAL AIRBORNE ASSAULT OPERATIONS, EMPLOYING A COMBINATION OF AIR FORCE ASSAULT AIRCRAFT AND US ARMY VERTICAL LIFT AIRCRAFT, TO SECURE OBJECTIVES AND FACILITATE THE FORWARD MOMENTUM OF THE LINK-UP FORCE.

FIGURE 5.

Army Aviation

The Army of the future must, in certain important respects, take to the air to achieve the degree of mobility required under widely dispersed conditions which will characterize future combat. This is in effect a modernizing effort whereby we will increase our mobility—a characteristic of any modern Army; increase our ability to command mobile troops and control fast moving situations; increase our ability to the effect of our own actions on the enemy; increase our ability to use our new weapons with maximum effect; and increase our ability to keep ourselves supplied with the necessities of battle.

—Major General Hamilton H. Howze
Former Director of Army Aviation,
Office of the Deputy Chief of Staff
for Operations

The devastating characteristics of nuclear fires have emphasized the importance of greatly increased dispersion on the modern battlefield. Coupled with this dispersion is the continuing need to "move," "fire," and "communicate." Army aviation provides a means of assistance in accomplishing these three requirements. Army aviation enables the commander to apply Army combat power at critical points on the atomic battlefield. All officers of the combat arms and services must develop a full appreciation for the important role that Army aviation plays in the operational and administrative support mission. To this end the Army aviation sub-course of study concentrates on four major areas:

Fundamentals of employment of Army aviation.

Capabilities and limitations of the aviation companies organic to the airborne division (ROTAD), the infantry division (ROCID), and the armored division (ROCAD).

Capabilities and limitations of Army transport aviation.

Employment of Army transport avia-

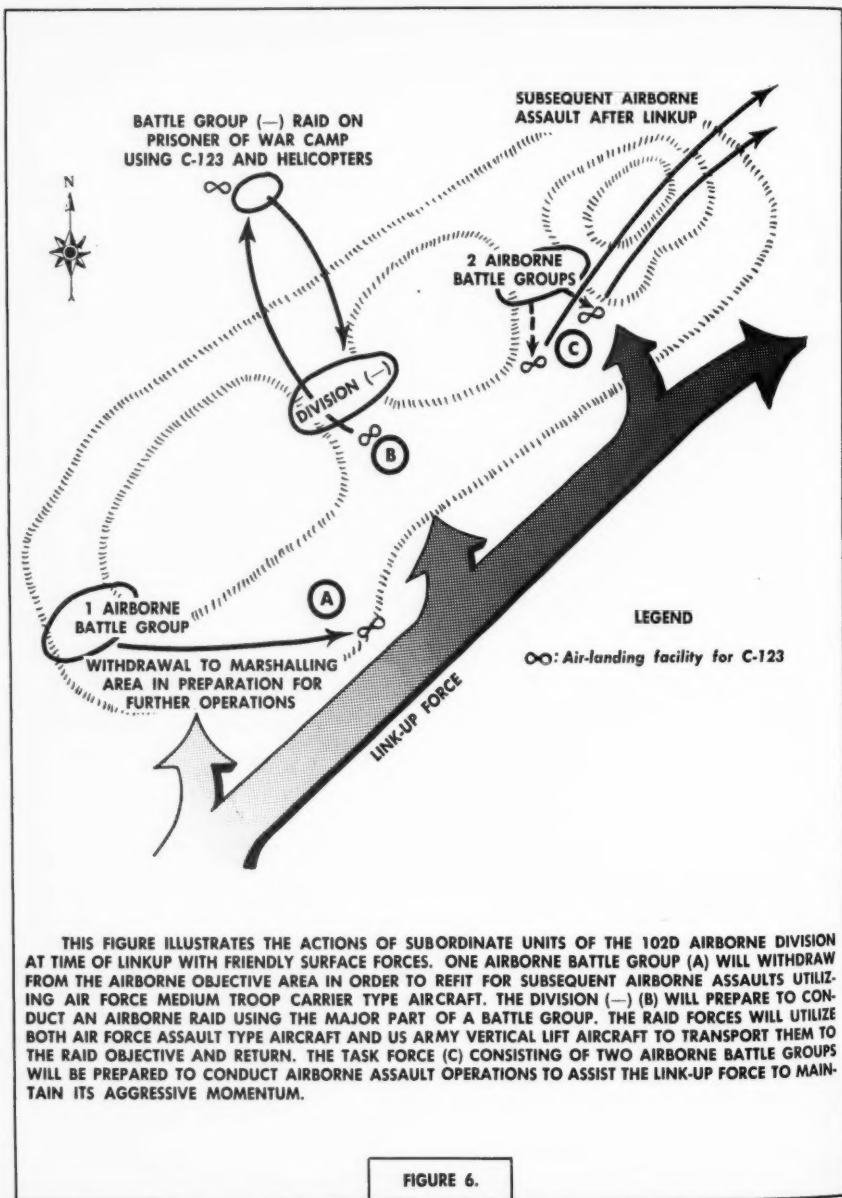
tion in both combat support and administrative support roles.

The familiarization phase of Army aviation instruction teaches the student the basic principles necessary to progress to the applicatory subjects throughout the College in which Army aviation is employed. In addition, the familiarization phase presents the basic factors, planning techniques, staff responsibilities and relationships pertinent to the employment of Army transport aviation. The student receives basic instruction in airborne operations in which Army transport aviation furnishes the required airlift. This instruction portrays realistically the interrelation between both the tactical and logistical uses of Army aviation. The capability and attendant problems of Army aviation in shifting rapidly from tactical to logistical missions and vice versa is illustrated.

The applicatory phase of Army aviation instruction requires the student to utilize previously acquired knowledge of Army aviation in a series of varied tactical and logistical requirements. The student is required to prepare concepts and make estimates and decisions which examine his understanding of the impact of air mobility on tactics and logistics. In this phase the student is introduced to current air-phibious concepts in which aerial vehicles are organic to combat units.

Applied instruction in Army aviation is included in the courses of study of all other instructional departments. This College-wide coverage emphasizes the capabilities of Army aviation to perform varied missions such as aeroground reconnaissance, target acquisition, command liaison, tactical troop movement, and logistical support missions by both organic unit and transport Army aviation.

The Army Aviation Section is the focal point of coordination of College instruction in its field of interest and furnishes guidance to other departments in the form of informal briefings and advice. In addi-



tion to instruction, the Army Aviation Section contributes to the doctrinal field. Doctrine responsibilities include the broad functional areas of: combat surveillance; tactical employment of air-mobile forces; command control, liaison, and communications; and logistics support to include movement of critical supplies and aeromedical evacuation. The doctrinal/instructional approach throughout the College reflects the philosophy that Army aviation is a combat tool that must be integrated into every tactical and administrative plan and operation.

Unconventional Warfare

Our capability of mass, nuclear retaliation is a strong deterrent to world war III. Still another deterrent is the readiness of subjugated peoples to revolt against Communist regimes. In the event of war, the latter would conceivably reduce the need to use nuclear weapons by generating immediate unconventional warfare deep in the enemy's homeland.

—Major General Orlando C. Troxel, Jr.
Chief of Special Warfare, Department of the Army

Unconventional warfare is often referred to as the "fourth dimension" of war. It is paradoxical to realize that one of the oldest forms of warfare is so little understood. World War II, and all major military operations since that time have demonstrated the effectiveness of guerrilla forces. A commander of the future cannot disregard this great potential as an assist to his conventional military operations.

The College, in recognition of this important aspect of military operations, has directed a significant increase in and broadened the scope of unconventional warfare for the 1958-59 subcourse of study. The student will be presented a more comprehensive and completely new series of unconventional warfare subjects. This subcourse of study will alert the student to

recognize the need for a clear understanding of the impact of unconventional warfare as it affects and contributes to conventional operations. It will highlight the requirement for new, forward-looking doctrine and improve his ability to assist in its development.

The familiarization phase will emphasize the close integration of conventional and unconventional plans and operations. The considerable reservoir of historical examples which will be presented will vividly portray the worldwide implications of unconventional warfare on our Army forces presently in the field and on future operations. The organization, planning, operational aspects, and support of unconventional forces will be given careful consideration from the Command and General Staff viewpoint. Concurrently, the student will be continually made aware of the requirement for integration of unconventional operations in the over-all plan for defeating the enemy.

Since the Department of the Army has primary responsibility in the field of guerrilla warfare, the College orients the student on the role in the organization, development, and control of guerrilla forces. In this application phase, the student will be given an opportunity to plan unconventional warfare operations at field army level in a general war. Here he will be required to consider the major factors and problems of coordination and control to achieve an integrated military effort between guerrilla forces and conventional forces. Particular emphasis will be placed on the problems of coordinating employment of nuclear fires in guerrilla areas by the conventional forces. The student will be taught to realize the importance of logistical support in maintaining the effectiveness of these forces.

The significance of psychological warfare is clearly recognized throughout the College and the nature of psychological warfare and its component elements will

be introduced to the student in a basic subject. The organization of the psychological warfare staff and its functions in the Army in the field will be taught. The relationship between intelligence and the propaganda effort will be fully discussed. Where appropriate, each instructional department will integrate psychological warfare into its course of study.

The subcourse will include a subject covering the field of antiguerrilla operations and will emphasize the need for new doctrine and tactics in this area for both present and future warfare. The fundamentals of antiguerrilla operations will be covered to include the requirement for planning and executing such operations. Here the instruction emphasizes the necessity for continued offensive action against guerrillas by highly mobile forces, to include extensive use of Army aviation and the close integration of intelligence and operations. The tremendous importance of psychological warfare operations designed to split the civilian populace away from support of enemy guerrillas will be fully emphasized.

In summary, the whole field of unconventional warfare is given a cohesive, integrated treatment throughout the entire College. Each department uses unconventional warfare requirements and situations in appropriate units of instruction. This over-all emphasis by other departments ensures practical, coordinated application and understanding by the student.

Summary

The Department of Airborne Operations and Army Aviation is dedicated to the belief that a modern United States Army, as part of the triservice team, must be prepared to fight under a wide variety of operational environments, employing new

doctrine on battlefields of extreme width and depth, with forces possessing increased firepower, and great mobility of mind, as well as means. To this capability must be added the strength of enemy-dominated peoples and their potential for developing well-organized resistance deep within the enemy's own homeland.

The instruction presented by the department is varied and versatile. It equips the future leaders of tomorrow's divisions, corps, armies, and unified commands to master new situations as well as those which now confront our military leaders and which threaten the security of the free nations of the world.

The College philosophy of providing the most forward-looking instruction and doctrine will further the objective to have all graduates of the U. S. Army's higher level schools proficient in operational planning incident to the tasks of employing mobile forces. These graduates must also be capable of operating in conjunction with indigenous forces with different ethnic and political backgrounds.

The basic principle upon which the Department of Airborne Operations and Army Aviation keynotes its instruction and doctrine is best brought out by these words of General Maxwell D. Taylor.

In war victory is to the strong and to the swift. During the Army's airborne invasion of Holland in September-October 1944, there was a critical bridge at Nijmegen over the Waal River in full view of the Germans at Arnheim. Over the bridge was a sign which acted as a powerful stimulus to military motorists: This bridge is under fire. Get mobile.

Our world is under fire. It behooves the Army—our Army—to get mobile.

MILITARY NOTES

AROUND THE WORLD

UNITED STATES

'Stratofortress' Modifications

The *B-52G Stratofortress* will be modified to serve as a launching platform for supersonic guided missiles. It will launch the *GAM-77 Hound Dog* guided airborne rocket far out of reach of defensive weapons. The *Hound Dog* has been de-



Stratofortress with shortened tail fin

scribed as an aerially launched weapon to carry a nuclear warhead many hundreds of miles beyond the aircraft's turnaround. The *B-52G* has an integral wing tank construction which virtually forms one huge fuel tank of the entire wing.

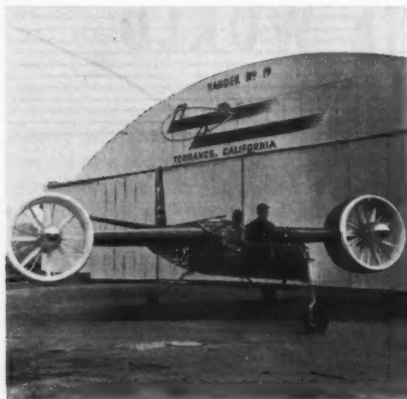
This, with fuselage refinements which also add to the fuel carrying capacity, will permit the aircraft to fly at sustained speeds in excess of 650 miles an hour, and will greatly extend its present unrefueled range of 6,000 miles. The *Stratofortress* has been provided a more powerful engine, and the external appearance has been changed by a reduction in the height of the vertical stabilizer.—News item.

Altitude Record

An *F11F-1F Super Tiger* fighter (MR, Apr 1957, p 66) has established a new altitude record for jet aircraft by climbing to a height of 76,828 feet. The previous record of 70,308 feet was held by a British *Canberra* jet and rocket aircraft. In level flight, prior to climbing for altitude, the *Super Tiger* attained a speed of better than 1,200 miles an hour. The swept-wing *F11F-1F*, a modification of the *F11F Tiger* now in service with the US Navy, is powered by a *J79* turbojet engine with afterburner. It is equipped with two retractable ventral fins which are extended when the undercarriage is retracted. The *F11F-1F* is under service test by the Navy, and already has been selected by the Japanese Government for its air force.—News item.

Ducted Fan VTOL Aircraft

The Doak *Model 16* VTOL aircraft is a more or less conventional aircraft with fixed wings and pivoting ducted propellers mounted on each wingtip. For takeoff, the ducted fans are tilted up to provide vertical lift. After takeoff, they are



US Army Photographs
VTOL *Model 16* with propellers tilted for
vertical takeoff (top) and forward flight

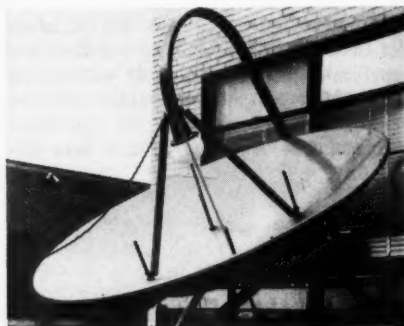
pivoted to the front to provide thrust for forward flight. The aircraft, built under US Army contract, has a *T53* shaft turbine engine of 825 horsepower mounted in the fuselage. The ducted propellers are shaft-driven through the wings.—News item.

Fast-Opening Parachute

A parachute under development for use by pilots of very low-flying aircraft, such as the *Flying Platform* and other individual lift devices, is capable of opening fully by use of explosives in eight-tenths of a second. The ordinary parachute takes five to six seconds to open.—News item.

High-Power Radar

Radar signals of a power of 17 million watts have been transmitted with high-peak power microwave equipment now under development. Using an eight-foot antenna, the signals transmitted were well beyond the capabilities of all currently



Antenna of high-peak radar equipment

operational radar sets and much greater than that previously believed possible.—Official release.

Variable-Range Missile

A project has been approved for the development of an advanced type of ballistic missile with a range that can be varied from 500 to 5,500 miles. To be called *Minute Man*, the project envisages underground installations harboring solid fuel ballistic missiles located several miles apart to reduce their vulnerability to attack. Completion of the program is expected to take from four to five years.—News item.

Air-Droppable Antitank Gun

The 90-mm, self-propelled antitank gun, the *M-56 Scorpion*, has been adopted as standard for the airborne combat group. Six of these weapons are utilized in the assault gun platoon of the combat group headquarters. The *M-56* is an unarmored, direct fire, breech-loading weapon using



US Army Photograph
Air-transportable *M-56 Scorpion*

fixed ammunition. It can be fired effectively at a maximum direct fire range of 5,000 yards. It is said to have excellent road and cross-country mobility, and is air-transportable in *C-119* troop carrier and *C-123* assault transport aircraft. The *Scorpion* weighs 7.5 tons, and was designed for air transport or air drop by parachute. Top speed is 28 miles an hour; it has a cruising range of 140 miles.—News item.

Marine Missiles

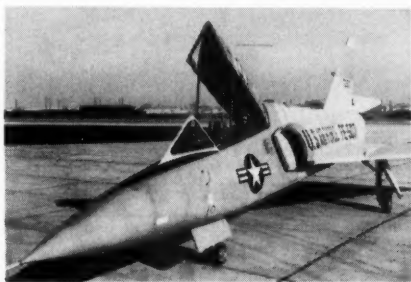
The United States Marine Corps will arm its troops with nine types of missiles. Four of the nine are operational with marine units, including the *Honest John* surface-to-surface rocket, the surface-to-air *Terrier*, and the *Sparrow* and *Side-winder* air-to-air weapons. Scheduled for future use by Marine Corps units are the surface-to-surface *Little John* and *Lacrosse*, the surface-to-air *Hawk* especially designed for action against low-flying targets, the air-to-surface standoff bomb *Bull Pup*, and an advanced version of the *Sparrow*.—News item.

Army Missile Command

An Army Ordnance Missile Command has been created that will combine the functions of the Army Ballistic Missile Agency, the Redstone Arsenal in Alabama, the White Sands Proving Ground in New Mexico, and the Jet Propulsion Laboratory in California. The new command will integrate the research, development, and testing of Army missile projects to include such developments as the *Pershing* solid propellant weapon and the *Jupiter* intermediate range ballistic missile.—News item.

Two-Seater 'Delta Dart'

The two-place version of the *Delta Dart*, officially designated the *F-106B*, has been test flown. Both the *F-106B* and the single-seat *F-106A* are undergoing a rigorous test program. Although performance and armament data have not been released, it has been reported that the standard designed armament will be two *MB-1 Genie* air-to-air missiles with nuclear warheads, and a number of *Falcon* rockets. One authority lists the speed of the *F-106A* as Mach 1.87 and the *F-106B* as being only slightly



F-106B Delta Dart

slower. The two versions of the aircraft differ only in the extra seat and the longer cockpit canopy, and will carry gear permitting the interception of attacking aircraft in any kind of weather, and at any time of day or night.—News item.

NAVAL NUCLEAR SHIPS AND REACTORS

Ship	Purpose	Comple- tion	Reactor*	Remarks
SSN571	<i>Nautilus</i>	Attack	1954	S1W Land prototype First nuclear-powered ship S2W Land prototype S1G
SSN575	<i>Seawolf</i>	Attack	1957	S2G
SSN578	<i>Skate</i>	Attack	1957	S3W
SSN579	<i>Swordfish</i>	Attack	1958	S4W
SSN583	<i>Sargo</i>	Attack	1958	S3W
SSN584	<i>Seadragon</i>	Attack	1959	S4W
SSGN587	<i>Halibut</i>	Guided missile	1959	S3W S3G
SSRN586	<i>Triton</i>	Radar picket	1959	S4G
SSN585	<i>Skipjack</i>	Attack	1959	S5W
SSN588	<i>Scamp</i>	Attack	1960	S5W
SSN589	<i>Scorpion</i>	Attack	1960	S5W
SSN590	<i>Sculpin</i>	Attack	1960	S5W
SSN591	<i>Shark</i>	Attack	1960	S5W
SSN592	<i>Snook</i>	Attack	1960	S5W
SSN593	<i>Thresher</i>	Attack	1960	S5W
SSGN594	<i>Permit</i>	Guided missile	1961	S5W
SSGN595	<i>Pollack</i>	Guided missile	1961	S5W
SSGN596	<i>Plunger</i>	Guided missile	1961	S5W S1C
SSN597	<i>Tullibee</i>	Attack	1961	S2C
SSGN (P?) 598	—	<i>Polaris</i>	1960 (?)	S5W (?)
SSGN (P?) 599	—	<i>Polaris</i>	1960 (?)	S5W (?)
SSGN (P?) 600	—	<i>Polaris</i>	1960 (?)	S5W (?)
CLG (N) 9	<i>Long Beach</i>	Guided missile	1960	C1W A1W
CVA (N) 65	<i>Enterprise</i>	Supercarrier	1961	A2W
DLG (N)	—	Frigate	—	D1W D2W

*In naval reactor code first letter indicates ship type, numeral indicates precedence in design series, second letter indicates industrial developer: W, Westinghouse; G, General Electric; C, Combustion Engineering. All are of pressurized, water-cooled, water-moderated types except S1G and S2G, which are cooled by liquid sodium and moderated by beryllium.

From *Nuclear Power for the Navy* by Commander Craig Hosmer
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U. S. Naval Institute Proceedings"

Three nuclear submarines, the *Nautilus*, *Seawolf*, and *Skate*, currently are operational with the Atlantic Fleet, and a fourth, the *Skipjack*, has been launched. The keels of two other nuclear-powered underseacraft, the *Sculpin* and the *Snook* have been laid. Two nuclear submarines to be equipped for firing the *Polaris* 1,500-

mile-range solid fuel missile also are under construction. The reactor to be used in the radar picket submarine *Triton* will have removable fuel elements which can be replaced from a tender so that the submersible will not have to return to a Navy yard for refueling. The *Triton* is to be equipped with two such reactors.—News item.

Manpower Saver

The *Ambulitter* consists of a simple, light pair of low-pressure pneumatic rollers in a frame readily attachable to a standard Army litter. It is said to reduce greatly the manpower needed in battlefield evacuation of casualties. With this device one man can move casualties quickly and easily over any type of terrain. By



Ambulitter aids casualty evacuation

substituting a lightweight frame for the litter, the *Ambulitter* can be used as an infantry weapon carrier or for the movement of as much as 500 pounds of supplies.—Commercial source.

Rocket Submarines

The Navy's second guided missile submarine, the *Growler*, has joined the operational fleet. The 317-foot-long *Growler* displaces 2,500 tons, and will be armed with the *Regulus II* missile (MR, Apr 1958, p 68). The diesel-powered undersea-craft carries snorkel equipment and can remain submerged almost indefinitely. A test firing of a dummy model of the Navy's *Polaris* missile also has been announced. Designed to be launched from well below the surface of the sea, the solid fuel *Polaris* will have a skin of stainless steel or

aluminum alloy. Its snub nose, shaped to deflect the intense heat of its 9,000-mile-an-hour plunge back into the earth's atmosphere after a flight of up to 1,500 miles, is to be covered with protective layers of plastic, copper, or possibly beryllium.—News item.

Tanker-Transport

The *KC-135* tanker-transport aircraft of the US Air Force is equipped with light, portable cargo loaders. The cargo-handling devices are powered by the electrical system of the aircraft. Designed for a maximum capacity of 8,000 pounds, the portable loader can be handled easily by the plane's regular crew and permits cargo to be loaded or unloaded without assistance from ground station cargo-handling equipment. A total of 345 giant transports has been placed on order. The *KC-135* weighs more than 250,000 pounds, has a wingspan of 130 feet, and is more than 136 feet long. It is powered by four *J57* jet engines of 10,000 pounds thrust each.



KC-135 with portable cargo loader

Top speed is more than 600 miles an hour and ceiling is above 35,000 feet. Aerial refueling tanks and equipment are located on the lower deck of the aircraft fuselage, leaving the upper deck free for cargo or personnel. The *KC-135* can accommodate 80 passengers or 25 tons of cargo. One of these aircraft holds the world's nonstop distance record of 10,228 miles for jet airplanes without aerial refueling.—News item.

ALASKA

'White Alice' Operative

The 3,000-mile communications network known as *White Alice*, under construction since 1955, has been completed. The system links together the radar warning outposts of the Alaskan Air Command and the Alaskan segment of the Distant Early Warning Line. It also provides close telephonic communication for the civilian residents of the vast Alaskan arctic region. A beyond-the-horizon method of radio relay is used employing huge antennas that transmit between stations as much as 170 miles apart. A number of telephone conversations and telegraph messages can be scrambled together, transmitted as a single signal, and unscrambled automatically at the receiving end. The network is operated under the control of the US Air Force.—News item.

GREAT BRITAIN

Crewless Submarine

A large atomic-powered submarine planned to be capable of crossing the Atlantic without crewmen aboard is now in the designing stage. Navigation and control will be completely by automation. Tests of miniature models of the vessel—which is planned to be faster and more powerful than any oceangoing vessel now afloat—have been completed successfully.—News item.

Naval Forces Revamped

Reorganization of the British Royal Navy will include the abolition of the Nore Command, and the closing of the dockyards at Sheerness and Portland. The Nore Command is located at the mouth of the Thames River and embraces the lower east coast of England.

The strength of the British Fleet for the coming year has been set at four aircraft carriers, six cruisers, 24 destroyers, 30 frigates, one minelayer, 28 minesweepers, 39 submarines, and necessary auxiliary vessels.—News item.

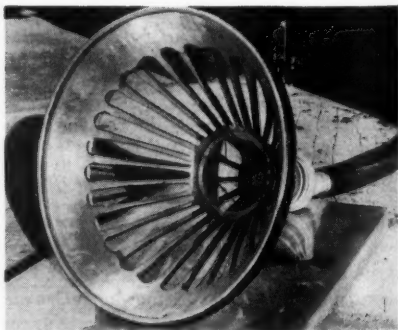
Aerial Refueling

A probe-and-drogue aerial refueling system developed in Britain is in use to extend the range of the Royal Air Force *Valiant* medium jet bombers. In service tests, one *Valiant* serves as a tanker to refuel another of the big bombers. The British-developed probe-and-drogue system differs somewhat from that in use by the US Air Force (MR, Oct 1956, p 68).



Valiant tanker refuels *Valiant* bomber

The swept-wing *Valiant* is powered by four *Avon* turbojet engines of over 10,000 pounds thrust each. The aircraft weighs 125,000 pounds at takeoff. Performance

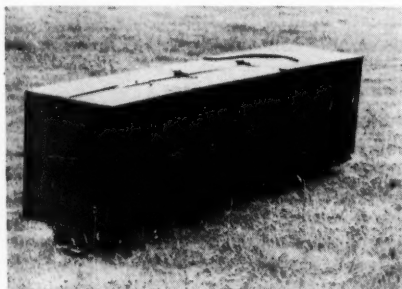


Drogue of British aerial refueling system

figures on the *Valiant* have not been released, but it has been credited unofficially with a speed of Mach .84, and is equipped with jettisonable wingpods containing *Super Sprite* liquid propellant rocket motors to assist in takeoff (MR, Nov 1956, p 78).—News item.

Airborne Jeep

A folding jeep which can be dropped by parachute has been tested successfully. The four-passenger, 700-pound vehicle, called the *Harrier*, weighs less than one-fourth as much as a standard quarter-ton truck and, when folded, occupies less than



Harrier folded for air-dropping (above) and ready for field operation (below)



one-tenth of the cargo space required for a standard vehicle. Capable of a speed of 60 miles an hour, the *Harrier* can carry up to 560 pounds in its alternate role of cargo carrier.—News item.

New Engines

The United States *T58* free turbine engine is to be manufactured in England where it will be known as the *Gnome*. It is planned for initial use in helicopters with later adaptation to turboprop installations. The *Gnome* will weigh 325 pounds

and deliver more than 1,000 horsepower.

The *Viper* turbojet engine is produced in several versions. The *Viper 8* is used to power the *Jet Provost T. Mk. 2* trainer, the *Viper 9* is an improved model with an increased thrust of 1,900 pounds. *Vipers 10* and *11* have thrusts of 2,000 and 2,450 pounds respectively. This engine also is built in France as the *Dassault Viper* and has a thrust of 3,000 pounds which can be raised 30 percent by afterburning.

A constant thrust version of the *Sprite* liquid propellant rocket motor has been developed for use in assisting the takeoff of the *V* class bombers, the *Victor* and the *Vulcan* (MR, Dec 1957, p 69). Installations will be similar to that previously announced for the *Valiant* (MR, Nov 1956, p 78).—News item.

Tri-Jet Airliner

The *D.H. 121* airliner will be powered by three *R.B. 141* turbojet engines, one mounted on each side of the rear fuselage and one in the root of the vertical stabilizer. It will be able to carry up to 100



The *D.H. 121* three-engine aircraft

passengers in high-density seating on stage lengths of up to 1,000 miles, or about 80 passengers in normal operations. The 12,000-horsepower of its three engines give it a top speed of more than 600 miles an hour.—News item.

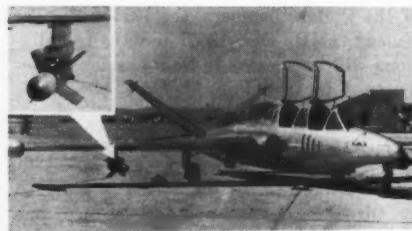
FRANCE

'Super Atar'

The latest in the line of *Atar* turbojet aircraft engines is the *Super Atar 26* which is reported to have a thrust of 18,000 pounds, and is designed for operation at a speed of Mach 3.—News item.

Missiles for 'Magister'

The *Fouga C.M.170 Magister* is to be used in training pilots in the firing of guided missiles and has been equipped with mountings for the *SS-11* wire-con-



Magister with wing-mounted *SS-11*

trolled missile (MR, Dec 1957, p 70). This plane, which carries one *SS-11* under each wing, is said to be particularly suitable for the attack of ground targets, releasing the missiles from a range of over two miles. In using the *SS-11* in an air-to-air role, it can be fired at parachuted targets from a range of about 11,000 feet, and has scored hits on an airborne target missile at ranges of a mile. The *Fouga C.M.175 Esquif*, the naval version of the *Magister*, also is to be equipped with the *SS-11* missile. The *Esquif* has completed its aircraft carrier qualification tests successfully.—Official release.

Helicopter Carrier

The helicopter carrier now under construction as a replacement for the cadet training cruiser *Jeanne d'Arc* will assume the name of the vessel it is to replace, according to a report. The new training vessel will displace 13,000 tons and will be

600 feet long. It will be armed with twelve 2.25-inch antiaircraft guns in dual mounts, and will be capable of launching surface-to-air missiles. The designed speed of the vessel will be about 25 knots, and it will have an operating radius of 12,000 miles. It will carry 200 midshipmen for peacetime training, and in wartime can accommodate an infantry battalion. It will mount 15 assault helicopters.—News item.

Fire-Fighting Helicopter

The *Alouette II* helicopter has been provided with special equipment for use in combating violent fires. The equipment, which weighs 814 pounds, is said to make the versatile helicopter extremely effective in a fire-fighting role. The *Alouette II* uses a three-blade main rotor driven by a 360-horsepower *Artouste* shaft turbine engine. It carries four passengers at a



Alouette II in fire-fighting role

top speed of 110 miles an hour, and has a cruising endurance of three hours, 15 minutes.—Official release.

Coleopter Planned

The *P.3* version of the *Atar Volant* flying engine, an enclosed cabin development of the *Volant P.2* (MR, Aug 1957, p 70), is powered by an *Atar 101E* turbojet with 7,700 pounds of thrust. The *P.3* is currently in flight test and will be followed by the coleopter *C.450* which is now in an advanced stage of construction.—News item.

Bomber Helicopter

Experiments have been conducted in dropping bombs from an *H-21* helicopter by the French Navy. In practice runs, all bombs carried have been dropped into a 20-yard square from an altitude of 2,000 feet. The bomb rack used holds from five to ten 250-pound bombs. The bombs can be dropped individually or by salvo, using the auxiliary jettisonable fuel tank system for controls.—News item.

Twin-Jet in Production

Deliveries of the *S.O. 4050 Vautour* twin-jet tactical support aircraft include 24 type A (ground attack), 27 type B (all-weather fighter), and two of the type B (bomber). The swept-wing *Vautour* has a top speed of 680 miles an hour and is armed with four 30-mm guns in the fuselage nose and 240 air-to-air rockets carried in the bomb bay. It also has underwing pylons for drop fuel tanks or rocket packets. A total of 160 of these aircraft is on order for the French Air Force, including 30 ground attack planes, 70 all-weather fighters, and 60 of the bomber version.

It has been reported that a number of *Vautour* aircraft are to be turned over to the Israeli Air Force.—News item.

INDIA

New Warships

The *Brahmaputra*, one of four planned *Leopard* class anti-aircraft frigates to be built for the Indian Navy, has been commissioned. The *Brahmaputra* displaces 2,400 tons and has a speed of 25 knots. It is armed with four 4.5-inch guns in dual mounts, two 40-mm anti-aircraft guns, and a *Squid* triple-barrel depth charge mortar. Other new construction includes four anti-submarine frigates of the *Whitby* class which are equipped with twelve 21-inch torpedo tubes and can achieve a speed of 30 knots, and four *Blackwood* class frigates.—News item.

WEST GERMANY

Missile Plans

According to a West German announcement, that nation plans to create two army groups equipped with *Matador* missiles. Initial equipment of the groups will consist of 12 mobile launching platforms for the 250-mile-range missiles. It also has been announced that a string of launching sites for *Nike Ajax* anti-aircraft missiles will be set up in North Rhine-Westphalia district to protect the industrial Ruhr area.—News item.

EAST GERMANY

Transport Tested

The East German four-jet transport, *BB-152*, scheduled for early testing is a 48- to 72-passenger plane with a cruising speed of about 500 miles an hour. Other characteristics of this aircraft are said to be similar to those of the Soviet *Tu-104*. Another aircraft, the *Baade BB-153*, is to be turboprop powered and is in the design stage of development.—News item.

AUSTRALIA

Big Airfield

A strategic airstrip under construction near Darwin will be nearly three miles in length. The new field, costing more than 11 million dollars, is so large that key vehicles and installations have been linked by radio to save time and assure constant communications.—News item.

Atmosphere Test

In a recent test, a *Skylark* rocket reached an altitude of 91 miles. The rocket, an experimental vehicle powered by a *Raven* solid propellant motor with a thrust of 11,500 pounds, released streams of aluminum foil which enabled radar tracking instruments to record wind velocity and direction in the upper atmosphere. To supply information on air density, 18 grenades were detonated during the flight.—News item.

BELGIUM

Do-It-Yourself Aircraft

The *Tipsy Nipper* is a lightweight airplane produced in a build-it-yourself kit for amateur constructors. The plane, which



Lightweight *Tipsy Nipper*

is powered by a 30-horsepower *Volks-wagen* engine, will cruise at 65 miles an hour and have a range of 187 miles.—News item.

SPAIN

Airbases Near Completion

United States installations in Spain, which include four major strategic airbases, a huge naval air station, an air supply depot, two naval fuel and ammunition depots, and a four million-dollar international communications center, are more than 80 percent completed. The main bases are linked by a 50 million-dollar underground pipeline which can store more than four million barrels of fuel. The 485-mile-long pipeline runs from Rota, on the Atlantic coast near Cadiz, through Moron de la Frontera and Torrejon de Ardoz on to the twin bases located at Saragossa. Approximately 5,000 United States military personnel are working and living at the bases, and about as many more are expected to be stationed at the installations during the next year.—News item.

Radar on Majorca

A radar installation is being prepared on the top of the highest mountain on the island of Majorca to fill in the gap between

the British radar sites in Gibraltar and the six new United States radar sites being constructed in Spain. The project to place the radar on the 4,300-foot mountain is expected to be completed by September 1959.—News item.

JAPAN

Fleet Increases

Four destroyers of the *Wave* class have been completed and have joined the Japanese Fleet, and two other vessels with similar characteristics are under construction. The four *Wave* class vessels, the *Ayanami*, *Isonami*, *Shikinami*, and *Uranami*, have a displacement of 2,500 tons fully loaded and a top speed of 32 knots. They are armed with six 3-inch guns, four 21-inch torpedo tubes, two hedgehog antisubmarine weapons and two Y guns. Although Japan has no aircraft carriers at present, an 11,000-ton carrier is planned for construction under the 1958 construction program. Five support landing ships (LSSL) have been returned to the United States Navy by the Japanese Maritime Self-Defense Force. The vessels were loaned to Japan five years ago, and are the first of 18 such vessels planned for return to the US this year.—News item.

THE NETHERLANDS

Ramjet Helicopter

The Netherlands-built helicopter *Kolibrie* (*Hummingbird*) is in series production, and is being sold abroad. The main rotor of this helicopter is driven by two 55-horsepower *TJ-5* ramjet engines attached to the rotor blade tips. The engines, which weigh only 20 pounds each, are said to be the simplest jet engines ever designed. They have no moving parts, operate on ordinary gasoline, and either of them can keep the machine in the air if the other fails. The craft weighs about 500 pounds empty and is capable of carrying a load of nearly a thousand pounds.—News item.

FOREIGN MILITARY DIGESTS

The Commander and the Evolution of War

Digested by the **MILITARY REVIEW** from an article by General of the Army P. Ely in "Revue Militaire d'Information" (France) June 1957. Translation by Mr. LaVergne Dale, Leavenworth, Kansas.

IN THE individualistic struggles which nations have had to wage to achieve independence, realize self-expression, and gain a place in the sun, military action has been employed along with political or diplomatic action to achieve the single objective of victory. Each of these forms of action was well-defined with its own period of duration, its own particular domain, and its own particular actors. The rules of the game forbade intermixture of the different forms of action, and victory brought concrete rewards. These were the annexation of border areas, the conquest of provinces, and recompense of glory and honors for both diplomatic and military participants.

The currents which today are drawing the world into a state of solidarity correspond to the new characteristics of civilization. They no longer are related to territorial ambitions, but to opposing concepts of the universal structure that finally will prevail. One of these two concepts envisages a strictly materialistic society in which individual personality is sacrificed to the functioning of society; the other

harmonizes the basic need of the individual with the requirements of society.

No less a profound transformation has occurred in the nature and forms of war. Resolved to protect their independence and the integrity of their territory by means of a strictly defensive battle, the democratic states believed that the problem of national defense would be resolved by military preparedness. The profound revolution that has occurred has brought us to a form of war so complex in its forms and so extended in time that neither mobilization of the masses nor exclusively defensive organization will handle it successfully.

The revolution is considerable. It is natural that minds are confused; the more so since the revolution in the form of war is concurrent with a transformation in structure due to the advent of the nuclear weapon.

In addition, account must be taken of that strange lag which always exists between what man conceives and what he does. This inertia, and the fact that the classical form of war continues to endure,

like an old framework in a new structure, explains, in large measure, the uneasiness of the army today and its vacillation in the face of the new horizons for which it has not been traditionally prepared.

But there is a deeper reason for this confusion. Although the various aspects of the new form of war may have been analyzed and studied, there is one aspect that has not been considered properly. It is the problem of the roles of the leaders.

The Role of the Leader

In the face of the new form of war and the uncertainties which it engenders in the human mind, the command, at every level, must have its position clearly defined. Each commander, wherever he may be, must understand his role. More than ever he must meet the demands of his essential function—to take upon himself his assigned responsibilities, relieve his subordinates of them, and assign simple and unequivocal missions.

That, in fact, is the essential problem. The fundamental principle on which all solid action is based and on which all efficiency depends is that the commander must, under all circumstances, always accept and never avoid his responsibilities.

Discountenanced by tasks which appear to pertain more to the civil, administrative, or judiciary domain than to military authority, some may be tempted to fall back into old grooves or to slip out from under their responsibility by spectacular excuses. However, the fact remains—war has expanded at the same time that it has deepened. Today the army exercises responsibilities in domains and to degrees that formerly were outside its field of action.

The army greatly dislikes this, perhaps as one dislikes any innovation which forces one to abandon fixed habits and requires other effort than that of the application of readymade solutions. But the fact cannot be escaped that the new form of war

necessitates a change of perspective and a change of style.

Whether it wishes this or not, the army finds itself at the focal center of responsibilities. The implacable judgment of history will excuse it for having known a bit of malaise and felt certain scruples before adapting itself. But history would not absolve it for having attempted to run away when the fate of civilization was at stake.

In the face of duty there is no choice to be made, no preliminary gradation, and no preliminary limitation to be established. Armed with the military virtues of authority, obedience, and mental discipline, the commander must give himself completely to his task.

Prerogatives

It is certain that authority, in its conception as well as its mode of expression, cannot escape the radical transformations of war. Because the milieu to which it is applied and the domains in which it is exercised are modified, authority must attempt to convince rather than to achieve its aims by force. The further men evolve and the greater the extent to which they have attained a high degree of civilization, the more they have a legitimate need to understand. In addition, precisely because war has assumed an ideological form, it has become indispensable to explain the objective that is being pursued.

Until recent times patriotism was simple—it was identified with the defense of the native soil, with the safeguarding of the national territory. It was to be seen in its concrete form in the "blue line of the Vosges." Today it is identified with action—against an enemy who is not always in uniform and who does not always speak a foreign language—to preserve values which are no less precious but, assuredly, less tangible. National tradition, love of action, and a sense of responsibility are just so many steps leading to a

higher concept which alone constitutes the objective to be attained.

The commander must discern his mission clearly. In the effort of the entire Western World, the task is to maintain (and, if need be, to build up) a civilization which will unite the permanent aspirations of the human individual with that form of organization of society that will be the most modern as well as the most beneficial for all. This harmony is the necessary condition of freedom.

Although authority must be enlightened it must not lose its power of decision. The ability to explain and persuade have military effectiveness as their precise limit. Going too far may lead to disorder. The commander must possess this difficult sense of balance and measure, or he must acquire it. There always comes a moment when, under the pressure of time and circumstances, he finds himself in the isolation of his responsibilities and faced with a decision to be made. Decision is a prerogative that is not delegated, shared, or justified. Once the decision has been made there is no longer time for explanation—only its execution counts.

The commander who, to satisfy his own scruples or those of his subordinates, would yield to the temptation to justify his decision would undermine the very essence of military authority. In other words, today more than ever, if the commander is to try to get his subordinates to think, he must reserve points of conscience for himself and solve them in silence. Silence is the soul of action.

Obedience

An exact parallel of authority, obedience is the other fundamental pillar of the army. They are mutually complementary. Thus, borne along by an evolution parallel to that of the notion of authority, obedience must allow more room to understanding. The more the subordinate has reflected and the more clearly he under-

stands the objective proposed by his commander, the better he obeys.

In this domain also, the moment arrives when obedience must be instantaneous, total, and constitute an article of faith with respect to discipline. Reflection must never become, more or less consciously, systematic criticism. Above all, criticism of one's superiors must never be an easy pretext for not fulfilling one's duties.

It is certain that criticism is too often an excuse for not accepting the responsibilities of obligation. Performing a task as a soldier, alone and without deviation, remains the basic order. Where the practice of discussion or examination of conscience leads to a weakening of obedience and to a laxer conception of the meaning of "the mission," and even to refusal of the supreme sacrifice, then the essence of discipline—the basic motivation of the army—is lost. For the soldier, the acceptance of this last is the sole criterion. It is a touchstone that permits no concealment and does not lend itself to lying.

Mental Discipline

It is precisely in this arduous search for a balance between the need to understand everything and the necessity for strict obedience, that commanders will find a virtue that is the very key to the solution of their difficulties. It is mental discipline. It is a difficult virtue because it clashes with the most redoubtable of prides. It is a primary virtue because it unites the free play of initiative with the rigorous exercise of obedience.

This virtue, in the final analysis, made the great armies, the great commanders, and the great victories. It consists of a total mental adherence to the intention of the commander, to the final objective he proposes, and to the general plan of action which he establishes in time and space. On the other hand it reserves great freedom of initiative in putting into ac-

tion material means and methods of execution.

If a commander has clearly defined his tactical idea in an order, his intention will remain as a conscious link in spite of the mutations of the fight. Means may then be modified. The subordinates, in a mental framework which they will have made their own, are then free to move and to react on the basis of circumstances and their own personality. It is with them as with the musician who retains his freedom of interpretation with the sole reservation that he is not to be false to the thought of the composer.

In a mobile and complex war, mental discipline is truly the basic virtue of command and particularly of commanders of high rank. It is also the primary quality of staffs.

Conclusions

Thus the hour has come for all commanders to think of their duties and of

their role in the new form of war. They must first realize clearly that all that has been said here concerning this form of war is not a theory portraying a still distant future. It is a present reality which surrounds them on every side.

They must then understand that this expanded, limitless war brings to them responsibilities which they cannot escape. To be able to face them they too must broaden their vision and expand their field of action. But, maintaining the perspective, the deportment, and the ideal of the soldier, they must be persuaded that for the very reason of the complexity of its repercussions, war must remain for the combatant a simple art wholly concerned with the execution of their missions. To safeguard and impose this simplicity, they have at their command these three permanent weapons: authority, obedience, and mental discipline.

Soviet Equipment

Digested by the MILITARY REVIEW from a copyrighted article * by Major R. E. W. Cole in "The British Army Review" (Great Britain) March 1958.

Up until September 1957 when the Soviets claimed to have fired an ICBM, and later in October when this claim was substantiated beyond all reasonable doubt by the appearance of the first artificial satellite, there was common belief that Soviet equipment was not up to Western standards.

In some ways the satellite has brought home to all of us the fact that we are not so far ahead as we thought, and reminds us forcibly of the wartime admonition to know thine enemy.

The truth about the Soviet Army and its equipment is that today it is, without doubt, the largest army in the world and

is equipped with a complete new range of well-designed and well-made weapons to fit it for war of any kind.

Probably the most outstanding improvements since 1945 are:

1. In heavy mortars, of which at least one is capable of firing a nuclear warhead.
2. Increased use of rocket launchers mounted on 6 x 6 cross-country vehicles.
3. A new range of recoilless antitank weapons.
4. Continued development of assault guns mounted on tracked cross-country chassis.
5. Complete new range of artillery; one weapon at least having nuclear capability.
6. Complete new range of basic in-

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fantry weapons, all firing a new, standard, lightweight round.

7. Better mobility resulting from a new range of helicopters, amphibious tanks, and B vehicles; a full range of tracked gun-towing vehicles; tanks



200-mm rocket launcher on ZIL-151 chassis

which combine protection with speed and punch at the expense only of comfort; and great progress in rapid pontoon bridging.

8. Greatly improved reliability due to much better standards of workmanship.

Heavy Mortars

There are two heavy mortars in the new range, the larger of which is 240-mm. This weapon has a caliber suitable for a nuclear shell. The maximum range is impressive, and a high rate of fire can be maintained. The smaller weapon is 160-mm caliber. Both are breech loading, have a high standard of accuracy, and are quick into action. They are towed muzzle first by a tracked prime mover or cross-country truck with their large circular base plates in place. Many smaller wartime designs down to 82-mm caliber are still in service.

Rocket Launchers

Three new rocket launchers have been produced since the war, all mounted on ZIL-151 6 x 6 diesel trucks. (These trucks

until recently were known as ZIS-151:—*Zavod Imeni Stalina*—the factory called Stalin—now being called *Zavod Imeni Lenina*.)

The largest launcher of 240-mm caliber is a 12-tube unit, the next is 200-mm on a four-tube mount, and the smallest is a 16-tube, 140-mm piece. The 200-mm carries the largest warhead and conceivably could have a nuclear capability.

Recoilless Antitank Weapons

The postwar range of recoilless weapons consists of the SPG-82 which weighs about 65 pounds, has an effective range of over 450 yards, can penetrate up to eight inches of armor, and fires an 82-mm fin-stabilized



57-mm self-propelled gun

hollow-charge projectile. It is the infantry company weapon.

The 107-mm is the equivalent of the BAT. This weapon weighs about 600 pounds, is towed on a wheeled carriage, fired from a tripod mounting, and can penetrate up to 12 inches of armor at a maximum effective direct fire range of a half mile.

Assault Guns

The Soviets use assault guns in the same way as Hitler's Wehrmacht and not as we use self-propelled artillery. Those mounting 76-mm and larger caliber guns have overhead protection.

The wartime range consisted of:

SU-76 (76.2-mm gun on modified T-70 chassis).

SU-85 (85-mm gun on T-34 tank chassis).



85-mm auxiliary-propelled field gun



Hound helicopter

SU-100 (100-mm gun on *T-34* tank chassis).

JSU-122 (122-mm gun on *Joseph Stalin* tank chassis).

JSU-152 (152-mm howitzer on *Joseph Stalin* tank chassis).

The best of these have been retained (*SU-100*, *JSU-122*, and *JSU-152*). The *SU-76* and *SU-85* now are obsolete; a completely new *SU* with 45-mm or 57-mm high velocity antitank gun has appeared re-

gory, both a high velocity gun and a heavier shelled howitzer instead of our compromise gun-howitzers.

The new weapons are:

1. 203-mm gun-howitzer *M1955*; firing a 300-pound shell to an estimated 28,000 yards. The caliber is suitable for a nuclear shell. This is the only gun-howitzer as such in the new family of weapons.

2. 152-mm howitzer *M1955*; which it is assumed will replace the older 152-mm 1943 model.

3. 122-mm field gun *M1955*; which uses the same carriage as the new 152-mm howitzer.

4. 100-mm field gun *M1955*; which is a dual-purpose field and antitank weapon.

5. 85-mm auxiliary-propelled field gun *D-48*. This weapon is the wartime 85-mm division gun with the addition of a motorcycle engine on the trail driving the main carriage wheels through a propeller shaft and differential. A third wheel, which is swung out of the way when the gun is in action, provides steering. The performance is sufficient to assist the gun out of deep atom-proof emplacements, and make prime movers unnecessary for short tactical moves, at least over good going.

6. 122-mm antiaircraft gun with associated radar control gear.

7. 100-mm antiaircraft gun *KS-19* which is also radar controlled.

8. 57-mm antiaircraft gun *S-60* which is a clip fed, radar-controlled weapon replacing the old 37-mm antiaircraft gun *M1939*.

Basic Infantry Weapons

We are standardizing on the 7.62-mm NATO round; the Soviets already have gone firm on their own 7.62-mm short round. It may be a little light for a rifle, and a little heavy for a submachinegun, but it has the advantage of interchangeability for all the new infantry weapons. These are:

1. The *Simonov* carbine which weighs eight and one-half pounds, is self-loading,



PD-47 and PZ-41 parachutes

cently on a modified *GAZ-47* chassis. Weighing only about seven tons this new *SU* well may be air transportable. The *GAZ-47* is a postwar vehicle, first appearing as a snow crossing vehicle at the Russian Antarctic base. *GAZ* means *Gor'kovskii Avtomobil'nyi Zavod*.

Postwar Artillery

The new range of artillery weapons is characterized by being quicker into action by reason of more mobile carriages. Weight for weight the Soviet artillery can outrange ours as they have in each cate-

and equipped with a small, permanently fixed bayonet that folds back when not required.

2. The *Kalashnikov* submachinegun. It weighs nine and one-half pounds and is fed by a curved 30-round box magazine.

3. The *RPD* machinegun which weighs 14½ pounds is either belt or drum fed.

In addition, two new personal weapons firing 9-mm parabellum ammunition are in general issue—the *Makarov* automatic which is similar to the German 9-mm

the *Hound* which has received the most publicity, but this may be because not many of the *Horse* type have been built.

Parachute Troops

The Soviets have made considerable developments in the field of parachuting. Apart from the large number of men trained and available they are carrying out new techniques and parachute designs continually.

The canopy of the main parachute has



PT-76 amphibious tank

Walther, and the *Stechkin* automatic with holster-butt along the lines of the *Mausers*.

Helicopters

The Soviets have realized fully the many potential uses of the helicopter and are working on the same lines as the Western Powers. They have built a complete range of helicopters from light two-seaters up to a heavy load carrier. These machines are all sound, sturdy designs which apparently work very well. There are already a considerable number of these helicopters in use.

Both the *Horse* and the *Hound* are used for troop and load carrying. So far, it is

a square shape. They claim that this design is better than the circular type as it gives less oscillation and collapses quickly on the ground, preventing dragging. In addition, parachutists are equipped with a reserve parachute.

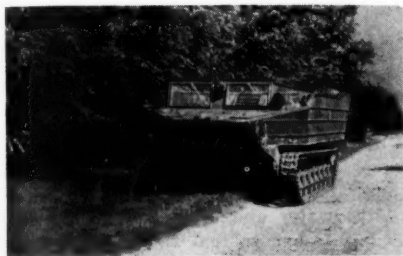
Amphibious Vehicles

Four amphibians are known to exist; all in considerable numbers. One is a tank and the others are armored personnel carriers or load carriers:

1. *PT-76* amphibious tank. This weighs about 15 tons, has a 76-mm gun with all-round traverse, and can enter the water

and swim without special preparation.

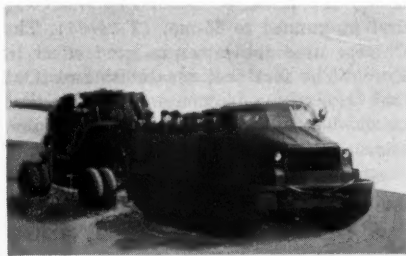
2. *K-61* tracked amphibian. This is a full tracked armored personnel or cargo vehicle carrying 20 to 30 men or a gun up to 122-mm caliber, and weighs about eight tons empty and 13 tons fully loaded.



K-61 tracked amphibian

Tracked Prime Movers

A very full range of tracked prime movers is available for towing artillery of all sizes. At least one armored and six different soft-skinned vehicles have been produced in great numbers. We already



M1950 towing 122-mm antiaircraft gun



Latest type TMP pontoon being launched from a truck

3. *GAZ-46* 4 x 4 wheeled amphibian which is a close copy of the wartime United States amphibious jeep.

4. *BAV* 6 x 6 wheeled amphibian which, like the *GAZ-46*, is another image, this time of the United States wartime DUKW.

have seen the unarmored *M-2* towing the big mortar; among the others are the *YA-12* and *YA-13* which are quite old designs. The latest are the *YA-14's* (*YA* for Yaroslavets), the *M1950*, and the "armored *TPM*" which bears such a close resem-

blance to the civilian GAZ-47 that it almost certainly must have come from Gorki also.

Tanks

The trusty wartime T-34 medium tank with 76.2-mm gun, itself more than a match for Hitler's 75-mm *Pz.KW.3*, was first up-gunned to 85-mm (T-34/85). The Chinese used the latter to good effect in Korea. The fact that a satellite had it at that time was good enough indication that the Soviets had something better for themselves.

After a false start with the T-44 (84-mm) which had suspension troubles, the T-54 emerged as the standard medium tank. Doubtless the T-44 designers were "directed to other fields."

The T-54 at 36 tons mounts a larger gun (100-mm) than either *Centurion 7* at 49 tons or *M-48* at 49 tons. It is light because it is small, not because it has no armor to speak of, and it is fast for the same reason. We, and the United States, are prepared to put up the weight for the advantage of more room inside.

Similarly the JS-3 (122-mm gun at 45

tons) is a good deal lighter than the *Conqueror*, but has not the same elaborate gun control equipment.

Production of both T-54 and JS-3 is measured in thousands.

Soviet Pontoon Bridging

The latest type of Soviet TMP pontoon bridge is used to make bridges and ferries of the 50-ton load class quite rapidly. The equipment is very simple; each pontoon section and its superstructure is carried on a ZIL-151 truck. The trucks back into the water and launch the pontoon sections as illustrated; two pontoon sections are joined in the water and the metal girders are swung around so that they rest at right angles to the pontoon pier and are then decked. Large numbers of men are needed, but these quickly made piers can be joined together to form a bridge or ferry at remarkable speed. Used in conjunction with the large quantities of amphibians now in the hands of Soviet engineers, these ferries and bridges go a long way to overcoming the problems posed by the threat of a nuclear strike during an assault river crossing.

Convergence of Efforts by a Coalition in War

Translated and digested by the MILITARY REVIEW from a copyrighted article by Eddy Baur in "Revue Militaire Générale" (France) April 1957.

THE surprise attack on Pearl Harbor gave the second European war the character of a universal conflagration. It confronted two coalitions in a merciless war of worldwide dimensions. Japan and Russia, it is true, preserved their nonaggression pact, but each nation was merely waiting for the defeat of its main opponent in order to look into the contentious Japanese-Russian agreement under more favorable circumstances.

Germany, Italy, and Japan were committed to a common line of action by the three-power treaty on 27 September 1940

that provided on the part of the contracting powers: "Mutual assistance in case of attack of one of them by a power not involved in a European war or the Chinese-Japanese conflict." On 3 December the Japanese ambassadors received orders to inform Von Ribbentrop and Count Ciano that danger of war against the United States was impending, and to ask, as soon as the war became a reality, their nations to declare war against Washington. Hitler and Mussolini agreed without discussion on 5 December, and on the 10th it became an accomplished fact. In the

meantime the three governments agreed among themselves not to engage in any unilateral negotiations with regard to armistice or peace with their common enemies—the United States and the British Empire.

All in all, Germany and Italy had interpreted extensively the *casus foederis* provided by the three-power treaty. Actually, they were in no danger of being attacked by the unprovoked Americans. It was up to Japan to open hostilities against the United States. The two Axis Powers had, of course, a certain interest in bringing light into the international situation by a declaration of war. It permitted their packs of submarines to bring the commerce-destroying war into the Atlantic without having to make distinctions between vessels of various registrations. Hereafter, they were able to intercept lend-lease deliveries more efficiently than in the past.

It is also true that Hitler and Mussolini would have embarrassed President Roosevelt had they not thus challenged their American adversary. During the preceding December while working out the strategic politics to be followed by the United States, General Marshall and Admiral Stark had come to the following conclusion:

In case of a Japanese aggression supported by the Axis, Germany must be defeated first, and Japan held at distance while waiting for ultimate occurrence.

In the meantime the traitorous attack of 7 December had intervened. One may still ask how the President, in view of the resulting disaster and the impending danger for the Philippines, could possibly have taken the initiative of declaring war against Rome and Berlin without being provoked by them.

Some important people probably would have told him that with eight battleships (from a total of 17) out of combat one does not take on two additional powerful

enemies. This reasoning certainly would have found a powerful echo in the public sentiment and would have been backed up by the followers of politics defined by the slogan "Pacific first." Let us add that General Tojo did not show any better political insight than his European partners.

Communication

Communication proved to be no problem between the new Anglo-Saxon allies. The defaulting Luftwaffe over the Atlantic could not interfere actively with air traffic, and fast battleships avoided the slower-maneuvering *U-boats*. Number 10 Downing Street, on the other hand, had been connected for a year by telephone with the White House. This permitted the Prime Minister and the President to talk with each other in perfect security after a waiting time of about two or three minutes. Communication was not so simple for Franklin D. Roosevelt and Sir Winston Churchill with their Russian partner. Nevertheless, it was only four days to the Kremlin by way of Gibraltar, Cairo, and Tehran for an English plane, and not more than a week for an American pilot.

The British Prime Minister proposed, as soon as the Japanese aggression became known, to visit the President personally in Washington together with his military chiefs, in order to discuss the developing situation on the highest level. The proposal being accepted at once, the British delegation went aboard the battleship *Duke of York* on 13 December and arrived at the airfield in Washington on the evening of 22 December.

The storms of the voyage could not prevent Sir Winston Churchill from formulating his precise ideas about future operations. There remained, however, a great unknown: the American attitude.

The American Attitude

How would America react toward the Atlantic while things became worse in the Pacific?

As he wrote in his memoirs:

Would we be able to persuade the President and the American military command that the fall of Japan would not bring upon the defeat of Hitler whereas it would only be a matter of time to deliver the final blow to Japan once Hitler was defeated?

Operation *Crusader*, launched on 19 November at Soloum-Halfaya, had taken this into consideration. It was going to bring the Eighth Army to Bengasi and saw its final object in the position of El Agheila-Marada, deep in the Gulf of Syrtis.

This accomplished, Operation *Acrobat* would get underway immediately. It would cross the desert, aiming at the fall of Tripoli. At the border of Tunisia the Italian-German forces under General Rommel would be cornered, leaving them no other alternative but envelopment or capitulation.

At this moment the government of Vichy would be given choice, according to Prime Minister Churchill's expression, of either curse or blessing. That is, it would be asked to welcome and support the Anglo-American forces in North Africa and to cover Algeria with the fleet of Toulon. If France agreed to this plan, the French Army in North Africa would be reequipped by the two Allies, if she refused one would have to proceed by force.

With a little luck the Allies would be in possession of the entire North African coast between Port Said and Dakar early in 1943. Provisions for the formation of bridgeheads in Sicily and Italy would be envisaged. Once the Axis was driven out of the Mediterranean, the liberation of the captive people of occidental Europe would follow, and some time in 1944 the destruction of Germany would be accomplished.

This plan also included a counterpart: to withhold the defense of the Pacific until it became possible for the Allies to

dominate the Japanese Fleet by bringing numerous aircraft carriers to this front. The Japanese troops in this region would then be defeated and the lost positions regained. According to Sir Winston Churchill this change of situation would take place about the end of May or June 1942.

This was the program proposed by the British Premier to President Roosevelt. The discussion was short and ended with a complete agreement. On 24 December General Marshall and Admiral Stark, confirming their estimate of 11 December, declared:

Even though Japan entered the war, we still consider Germany the main enemy. Her fall will be the key to victory. Once defeated, the collapse of Italy and the decline of Japan will follow inevitably.

Called to approve that statement as a basis for all future operations, Sir Winston Churchill and his civil and military entourage agreed, as one can well imagine, with enthusiasm.

Integrated Command

There was a certain danger that this declaration might remain on a purely platonic level. To avoid this, the American war production programs were re-examined with due consideration to eventual future deliveries to Russia. Also, it was decided to form a "mixed council of the chiefs of staff" to be stationed in Washington. The competence of this institution went further than just simple coordination of operations. It achieved an atmosphere of interallied and "integrated" command. The Imperial Chief of Staff, Sir Alan Brooke, who had not been able to leave London, and Admiral Pound together with Marshal Portal instituted Marshal Dill as delegate, assisted by advisors of the three armies, to represent the British interests.

The first war conference of the two Anglo-Saxon Allies ended with very satisfactory results. Agreement about the

major objectives was obtained. An organ that would ensure the preparation and command of coordinated operations as directed by the American and British Governments was created.

The Allies would provide aid to Russia in the priority accorded to the European theater of operations, instead of turning their back on the USSR by giving preference to Southeast Asia and the Pacific. The conquest of the Mediterranean on the other hand would facilitate the transportation of arms and ammunition to Russia, and Allied help would reach the Gulf of Persia by way of Suez at much lesser cost. Let us consider that neither the United States nor Great Britain asked Russia to open a "second front" in Manchuria or the Sea of Japan. On 12 December Sir Winston Churchill wrote:

Of course such an intervention would be very advantageous but only under the condition that Russia does not impede its operations on the Western Front either now or next spring.

These were the general lines of instruction for Anthony Eden who had left Scapa Flow for Moscow on the night of 7-8 December. No pressure with regard to a declaration of war against Japan should be exercised upon Russia. Inspired by the same thoughts were the propositions Winston Churchill intended to present at the White House. It would have served no purpose to declare Hitler as the main enemy if Stalin had to give up even a small amount of the enormous pressure he exercised on the German forces.

It is a known fact that on 20 January 1942 Rommel's lightning counterattack, launched from the position of El Agheila-Marada, surprised the Eighth English Army and inflicted considerable losses. The Eighth Army was thrown back beyond Bengasi and Derna on the line of El Gazala-Bir Hakeim. This brought an end to Operation *Acrobat* and postponed Operation *Gymnast*.

Even though it turned out to be a formidable short-range miscalculation, the United Council of Chiefs of Staff maintained and pursued unperturbed their long-range concepts of war consisting in convergence of efforts and concentration of means. The Allies revenged their serious defeats of the preceding spring at the end of the year. El Alamein, the *disembarkement* from North Africa, and Stalin-grad were not only a sharp retaliation for Tobruk, Kerch, Sevastopol, and Kharkov but announced also the early downfall of the inimical coalition.

Axis Communications

Documents enable us today to see beyond the barricades. We may say that the misunderstanding of the above mentioned principles by the members of the Axis three-power treaty sterilized their initial successes of the first part of the year 1942 and led them from the threshold of victory to the final catastrophe.

The communication between Japan and her European allies was, of course, more difficult. It was out of the question for Hitler, Mussolini, and Tojo to discuss their war plans in a roundtable talk whenever necessary as did Churchill, Roosevelt, and Stalin. Regular communication by radio could be used only with certain precautions, since long and frequent messages exchanged by this way between Berlin, Rome, and Tokyo would have been intercepted and deciphered. In addition, America had discovered the code used by the Japanese Navy and diplomatic corps. Consequently, the instructions of General Tojo to his accredited ambassadors in Germany and Italy did not remain unknown.

The same excuse, however, cannot be given to the exchange between the two partners of the Axis, Berlin and Rome. All in all from 22 June 1941 they fought two parallel wars. Of course, it was understood that Germany would, once Russia was defeated, turn with united forces against England. After the defeat of Mos-

cow and the first offensive of the Russian winter, Italy had to face the Anglo-Saxons almost alone; meanwhile the Wehrmacht recognized the fact that the Red Army was its main enemy. Here some irritating questions could be asked.

The exchange of letters between the Duce and the Führer, and the accounts of their periodical reunions show that they give each other mutual orientations about the development of current operations. Seldom, however, do they discuss problems arising out of the general conduct of war in order to arrive at an integrated solution as Franklin D. Roosevelt and Sir Winston Churchill did frequently. Nothing in the camps of the Axis would compare with the Anglo-Saxon United Council of Chiefs of Staff. Only very hesitantly did the Axis Powers try to coordinate their war production.

In addition to this, Hitler had taken over command of the operations at the Eastern Front after Marshal von Brauchitsch incurred his displeasure. Without sufficient leisure and freedom of mind he was unable to pay attention to the problems of over-all command and even less to those brought up by the conduct of the coalition war. Even though he had confidence in Mussolini, he distrusted his son-in-law, Count Ciano, and the Italian Army. The Duce on the other side, whose health was not the best, was embittered against his own people, and his temper had soured against Hitler whom he suspected of reconciliatory wishes with France and of failing to support his claims on Nice, Corsica, and Tunisia. It is obvious that the basis for good collaboration between Berlin and Rome was lacking.

Opportunities

However it may be, when the Russian offensive came to a standstill toward the end of February 1942, the most brilliant opportunities were open to the armies of the three totalitarian powers. Since mid-November of that same year America had

lost five out of 32 capital ships, and eight others were damaged so severely at Pearl Harbor and Alexandria that they had to stay out of action for many months. On 15 February 1942, Singapore showed the white flag, and the allied squadron of Admiral Doorman was almost completely destroyed shortly thereafter without being able to prevent the Japanese from taking Java. To make things worse, the conquest of the Indian Archipelago opened the Indian Ocean to the Japanese Navy and air forces. What would be the next chief objectives of that armada: Ceylon or Australia?

That had been an often asked and never answered question in Japanese naval circles. It would suffice, according to Rear Admiral Ugaki, Chief of Staff of the Combined Fleet, to occupy Johnston, Palmyra, and Midway Islands. Then Hawaii would have to be attacked, a step leading to a decisive battle against the American Fleet of the Pacific, before it had a chance to repair its losses of 7 December and before the United States could exploit her uncontested superior industrial power.

The Chief of Operations of this Combined Fleet was of a different opinion. Another attack against Hawaii would not benefit by surprise. The attack would only expose the Japanese Fleet to a combined action of enemy forces including fleet and land-based air force and even coastal artillery. Under those circumstances an exploitation of the fall of Singapore directed toward the west was suggested. This would synchronize the Japanese offensive with planned operations of the Wehrmacht in the Near East. The destruction of the British Navy would lead to Japanese superiority in the Indian Ocean and to the possession of Ceylon. From here on they could seek contact with the other Axis Nations in the Red Sea or the Gulf of Persia.

This plan encountered two objections: first, the three-power treaty of 19 Janu-

ary 1942 was full of insignificant banalities and did not guarantee at all that the Germans and Italians would come to their help if operations were pushed into the Indian Ocean. The second objection was the requirement of army forces for the conquest of Ceylon, refused under pretext of a "Russian menace." The first objection could be bypassed, but the importance of the second could not be denied. Thus the Chief of Staff of the Combined Fleet, who had recommended this plan, came back to the project of Midway that now included the Aleutian Islands.

A third warning was given to the Chief of Staff of the Navy by Rear Admiral Fukudome and Captain Tomioka. In their opinion the conquest of Australia was more important. The "subcontinent" would otherwise sooner or later provide a logical base from where the enemy could launch an irresistible counteroffensive. But, since another 10 army divisions would have been necessary for a conquest of that kind, one can imagine that the army protested even more against this strategical suggestion.

The army was not really bothered by the Russian menace of the Far East. It even counted on the breakdown of the Red Army under the blows of the Wehrmacht in the summer or fall of 1942. Then, without having tried the least diversion of Russian forces to assist their German ally, it would attack Vladivostok and Transbaikalia. Japan was prepared after all, despite the nonaggression pact of 14 April 1941, to attack Russia in a war that was started by Russia against Japan the day after the two explosions of Hiroshima and Nagasaki. We do not propose any moral judgment about this Machiavellism. It must be remembered, however, that this attitude gave the Russian command freedom of action at the most critical moment of the German-Russian war.

The Final Plan

The opposition of the Japanese Army forced the Chief of Staff of the Navy to

take a much more modest project into consideration that foresaw only the isolation of Australia by occupation of New Caledonia, the Fiji and Samoan Islands. As the Japanese combined fleet was still moving toward Midway and the arguments increased, an event happened on 18 April 1942 that established unanimity among the admirals: it was the bombing of Tokyo by B-25 planes from the aircraft carrier *Hornet*. It was obvious now that the chief objective had to be the diminution of the American Fleet if one wanted to save the Emperor's palace from another outrage of that kind. Everybody agreed upon the following plan of future operations:

June: Midway, then return to Truk.

July: New Caledonia and Fiji.

August: Johnston and Hawaii.

Admiral Yamamoto hoped that in the course of his amphibious operations the great victory would occur. With his 11 carriers (seven large and four small) against the four on the American side his hopes for a new victory for the Rising Sun were quite justified.

The evening of 26 May 1942 the carriers of Vice Admiral Nagumo, spearhead of the Japanese Navy, left their anchorage in the interior sea and headed for Midway. At the same time, the impulsive Rommel gave the signal of attack to the Italian-German forces of Libya. Their first objective was the destruction of the Eighth British Army and the fall of Tobruk. It is not necessary to point out the coincidence of the diverging efforts of the allies of Tokyo and Berlin: both were moving toward the east.

If?

What would have happened if the ideas of Captain Kurichima had been transformed into practical strategy? What would have been the consequences of an order for Admiral Kondo, commander of the Japanese forces operating in Indonesian waters, to destroy the British Squadron in the Indian Ocean and to pur-

sue operations in the general direction of Aden? It does not help to rewrite history, but it is possible to analyze a situation at a given moment. According to such an analysis the balance of power was not in favor of Great Britain at that time.

Admiral Sir James Somerville, new Commander of the British Navy in that area, lost, at the start, the cruisers *Cornwall* and *Dorsetshire* on 5 April. On 9 April the small carrier *Hermes* and the large carrier *Colombo* were sunk by the air-naval forces of Vice Admiral Nagumo. A great battle in the middle of April would, therefore, have opposed five battleships, two carriers (100 to 120 planes), and six cruisers on the British side with two Japanese battleships, five carriers (about 315 planes), and 10 cruisers. But the superiority of Admiral Kondo was even greater than the mere numbers would indicate.

It is a fact that the four British cruisers of the *Revenge* class were lacking the necessary speed and radius of action. They deserved the name given to them by Sir Winston Churchill in a letter to the First Lord of the Sea on 29 August 1941: "Swimming Coffins." Among the ships of that class only the refitted *Warspite* was of military value. Particularly, the inferiority of the aviation aboard the *Formidable* and the *Indomitable* was not only quantitative but also qualitative. For example, a formation of 12 *Swordfish* torpedo planes taken by surprise by enemy fighters went down without one survivor. On the other hand, it is very doubtful whether the *Albacore* fighters of the two carriers would have had a chance against the deadly *Zeros* and *Zekes* of Vice Admiral Nagumo. However it may be, the British squadron would have been attacked, torpedoed, and torn apart to the very last ship.

Admiral Somerville was, therefore, well-advised when he took his ships back to Kilindini, near Mombasa on the oriental

coast of Africa. The consequence of that order, given 7 April, left the whole Indian Ocean to enemy operations. But at that moment Admiral Kondo received his orders. He turned and left by the Straits of Malaga and anchored after 10 days of peaceful cruising at Kure base on 22 April.

Here the importance of the waterway leading from the Cape to Suez and the Gulf of Persia cannot be stressed enough. The troops and material that barred Rommel's way to Alexandria before defeating him at El Alamein came by this route. Along here came the provisions for Russia too, at the moment when German *U-boats* and torpedo planes began deducting their toll in advance from the convoys of Murmansk. Another point to be considered is the fact that the British Eighth Army received its fuel from the famous oil distillery of Abadan.

To intercept this communication axis with a supported operation would probably have opened the Near East to the two Axis Powers. On 3 August 1942 Marshal Cavallero, Chief of Staff of the Italian Supreme Command, tried to explain this to General Chimitzu in charge of the Japanese military mission accredited to the Duce. He did not know about the disaster of the Japanese combined fleet under Admiral Yamamoto on 4 June in the waters of Midway. Some Allied transports had been attacked with torpedoes by Japanese submarines between Durban and Aden. This was not, however, the result of a great definite strategical operation.

Divergent Efforts

It has been maintained that the application of Captain Kurichima's project would have caused the American Fleet in the Pacific to attack Japan. Certainly one would have to take that risk, but it was probably not a great one, especially because of the Anglo-American decision of 24 December. This decision was known to

Japan and relayed in its essence to the Italian Chief of Staff by General Chimitzu on 10 January 1942.

If, on the other hand, the Japanese would have gone into operation in the Indian Ocean, President Roosevelt probably would have sent more ships to the European waters, as he had not hesitated to send the warships *Wichita* and *Tuscaloosa*. These were to permit the British Home Fleet to free the warships necessary for the expedition Diego-Suarez. A telegram sent to the British Premier on

17 April 1942 leaves no doubt about his intentions with regard to this matter.

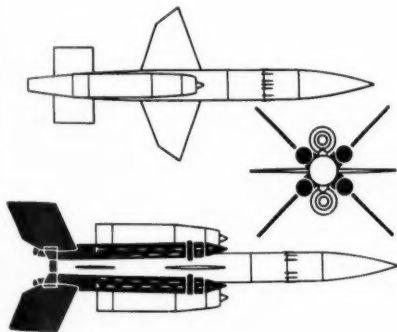
Hitler, Mussolini, and Tojo, each pursuing his particular and divergent objective, were defeated decisively in 1942—the last year that could have brought them victory—at Midway, El Alamein, and Stalingrad. All three of them neglected what 50 years ago the students at the Military Academy used to call disrespectfully: "The refrain of Father Cardot:" *My friends, strike powerfully and strike together.*

Instruments of Interception

Digested by the **MILITARY REVIEW** from a copyrighted article in "Aeronautics" (Great Britain) March 1958.

THE Bristol/Ferranti *Bloodhound* is Britain's primary surface-to-air missile. The *Bloodhound* weapons system will comprise Great Britain's inner defensive ring, the outer defense being mounted by P-1

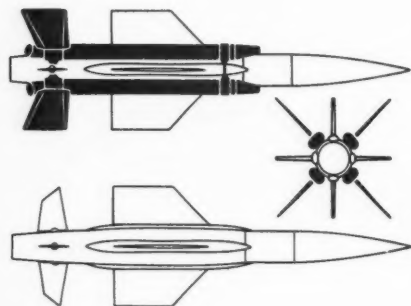
16-inch ramjets mounted above and below the missile. These raise the speed of the missile to a maximum believed to be about Mach 2.2. The wings of the *Bloodhound* are of larger area than those generally seen on missiles of like size and weight, and indicate a high-degree of maneuverability. They are pivoted, and can be moved together constituting pitch control, or in opposition for rolling control. The tail surfaces are fixed. The *Bloodhound* is a semiactive homing missile; a "dish" in the nose receives the reflected beam of a ground-based, target-illuminating radar. Ground-based equipment includes a long-range radar that locates the target initially, and a computer which feeds information of the raider's position to a further radar, which emits the target beam and also controls the bearing of the missile launcher and flashes a warning light in front of the firing controller when the target is in range. The *Bloodhound* system is almost entirely automatic and is semimobile. The first *Bloodhound* base will be at North Coates, Lincolnshire, England. The dimensions are: length, 22 feet two inches, diameter, 21 inches, span, nine feet three inches, and weight, 2,200 pounds.



Bloodhound

long-range interceptors. The *Bloodhound* is launched from a zero length launcher under the power of four solid propellant boosters which accelerate it to Mach 1.6. The sustainer motors are two Bristol *Thor*

Full tactical mobility is the keynote of the English Electric *Thunderbird* weapon system, and it has better low-altitude capabilities than the *Bloodhound*. It has been ordered by the British Army for key-point defense in the field, and an order from the Royal Air Force was announced last September. The RAF presumably will use its *Thunderbirds* primarily for the defense of overseas bases. The initial development contract for the *Thunderbird* was placed in 1950. Since 1952 hundreds of test firings have been made at Aberporth and Woomera, many with recoverable vehicles. The liquid fuel sustainer of early

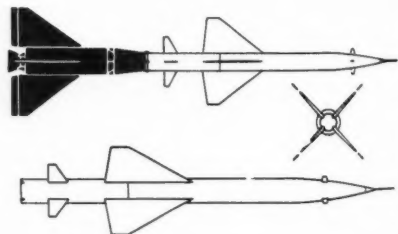


Thunderbird

development rounds was considered incompatible with simple field operation and has been replaced by a solid propellant charge. Four wraparound solid boosters are used for launching from a zero length launcher which can be elevated to 90 degrees. These boosters carry large fixed fins. After burnout the front attachments are released and the aerodynamic loads on the outwardly tapering nosecones cause the booster tubes to pivot on their rear anchorages which are then released. The cruciform control surfaces are of noticeably large area, for the moment arm is short due to the necessity to keep the

propellant charge close to the center of gravity. Angle of sweep of the cruciform wings is commensurate with a speed of about Mach 2. The wings are of double arc section, but the tail surfaces are trapezoidal. The *Thunderbird*, like the *Bloodhound*, is a semiactive homing missile and the receiver and guidance package is installed in, and immediately behind, the dielectric nose radome. The external fairings, presumably, contain guidance leads. The dimensions are: length, 18 feet 11 inches, wingspan, five feet seven inches, and control surface span, five feet three inches.

The Soviet antiaircraft weapon, paraded on articulated trucks in Moscow in 1957, is part of a developed, mobile, and fully operational defensive system. The single-axle trailer carries the missile on elevating rails; thus being its mobile

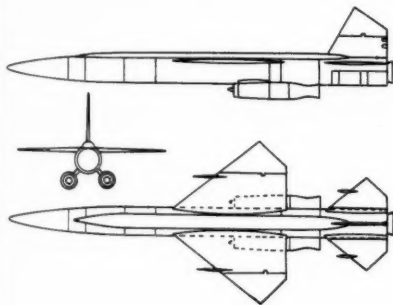


Soviet antiaircraft missile

launcher. The weapon is a two-stage rocket with a large, solid fuel booster mounted in tandem, the sustainer motor probably being a liquid fuel unit. Nose antennas indicate that semiactive homing guidance is used. The cruciform delta aerofoils are indexed in line with the control blades. The aerofoils on the booster stage carry movable surfaces along the trailing edges for control during the low-speed launching phase. The length of the missile at launching is about 33 feet, the booster

accounts for one-third of this length. Estimated launching weight is 4,500 pounds, and the slant range 22 miles.

A pointer to the *Bomarc's* exceptionally long range, 300 miles, is in its classification as an "area defense" missile; other surface-to-air missiles are considered "point defense" weapons. It is an aerodynamic vehicle powered by two underslung *Marquardt* ramjets mounted on struts from the 36-inch diameter fuselage. It is accelerated to ignition speed with the

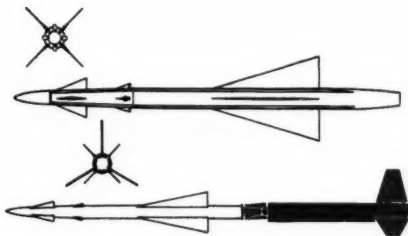


IM-99 Bomarc

aid of a liquid fuel rocket booster mounted in the tail. To obviate center of gravity problems as the propellants are consumed, launching and early flight are in the vertical plane, control during this phase is by means of the gimbal-mounted booster combustion chamber. All-moving tip control surfaces on mainplane, tailplane, and fin exercise aerodynamic control during the later phases. *Bomarc's* operational capabilities extend to over 60,000 feet, and its speed is reported to be Mach 2.75. Launching weight is 15,000 pounds. The launching is programed by SAGE, the automatic radar reporting and computing system intended to direct operationally the aerial defense of all North America. Radar guidance processed through a computer and ground-air data link directs the

missile to the vicinity of its target. At this stage the *Bomarc* becomes an active homing missile, and the air interception radar in the radome nose directs the missile on a collision course. During development firings, which began in 1952, preproduction unarmed *Bomarc's* have destroyed drones by impact; the nuclear or high-explosive warheads of the operational version are proximity fused. The first production *Bomarc* was delivered on 30 December 1957. Four *Bomarc* bases are being built for Air Defense Command in Maine, New Jersey, Massachusetts, and Long Island, New York, and an operational training base at Santa Rosa Island, Florida, is nearly completed. A further contract for about 100 missiles has been announced.

The United States Army's *Nike Ajax* is the West's most established guided missile, and has been operational with the Continental Air Defense Command since the end of 1953. *Nike* batteries have been set up around major United States cities and strategic targets since that time. Sites have also been established in Alaska,



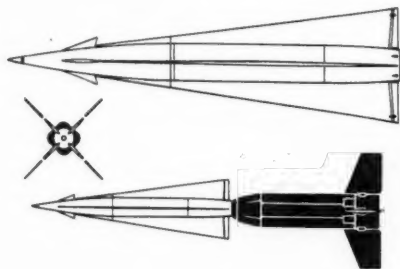
Nike Ajax

Greenland, and Germany; and thousands of the missiles have been manufactured. The sustainer motor is a 2,500-pound thrust liquid fuel rocket with a large solid fuel booster. *Nike Ajax* is tied in with the continental SAGE (semiautomatic ground environment) or its localized counterpart,

the *Missile Master*, for United States aerial defense. Radar equipment at each *Nike* battery consists of a long-range "acquisition" radar which, following detection of the target by early warning radars, tracks it until it is within the range of the second target-tracking radar. This radar feeds information of the target's position and speed to a ground computer. When the target is within range (maximum about 30 miles), a warning is presented to the battery control officer who selects the previously prepared missiles which have risen on their vertical launchers from underground bunkers. A third radar tracks the missile and feeds its position data into the computer which then deduces the commands to be sent for the missile to make an interception. Guidance is exercised by means of the cruciform canard aerofoils, and the high-explosive warhead, surrounded by fragmentation material, is detonated by a command signal. The maximum speed is about 1,500 miles an hour. Although no new *Nike Ajax* missiles have been procured recently, and the *Nike Hercules* will begin to supersede it in the batteries this spring (1958), the United States Army has applied for funds to rebuild approximately 4,000 which have become nonoperational due to corrosion after long periods on their launchers. The Army has stated that periodic rebuilding is necessary to maintain operational effectiveness. *Nike Ajaxes* are to be supplied to a number of NATO countries.

Although *Nike Hercules* has a range about three times that of *Ajax*, has greatly increased speed, improved guidance, and carries a nuclear warhead, the emphasis has been all along that it easily can be integrated into existing *Ajax* batteries. It is now in quantity production. Operationally simpler than its predecessor, *Hercules* has a Thiokol solid propellant sustainer obviating the corrosion problems of liquid fuels and minimizing problems of handling and storage. The vast four-bar-

rel, solid propellant booster carries stabilizing fins. The cruciform acute delta wings of the missile carry outriggered trailing edge control surfaces, and the missile is stressed for maneuvers involving greater accelerations than those imposed upon the *Nike Ajax*. The modification of ground equipment to suit the *Hercules* improves the operational effectiveness of the *Ajax*; the conversion of *Ajax* batteries for the *Hercules* is proceeding ahead of the delivery

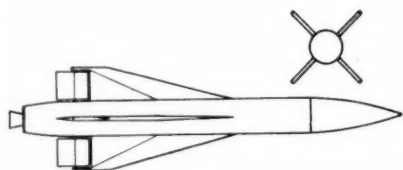


Nike Hercules

of the later missile. The *Hercules* is believed to contain its own radar terminal guidance, being guided to the target vicinity by command radar. *Nike Hercules* is 27 feet long and 25 inches in diameter. The span is six feet two inches and the weight without warhead has been quoted as 5,000 pounds. Speed is reportedly Mach 3.3. The *Nike* series is being extended with development of *Nike Zeus*, adopted as the United States primary antimissile missile.

An early objection to guided interceptor missiles was that they could cope only with high-flying attackers, giving long warning of their approach, and that they afforded no protection against attacks at low altitude. The United States Army's *Hawk* is designed to counter attacking aircraft in the airspace below those altitudes where *Ajax* and *Hercules* are effective.

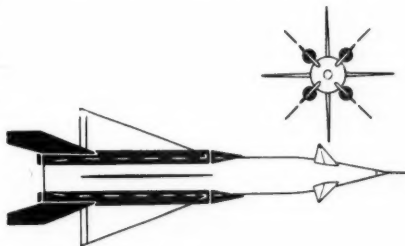
Mobility is the keynote of the *Hawk* concept, it is transportable by helicopter. Thus it has a place both in the continental defense of the United States; where it complements the high-altitude interceptors, and in battlefield deployment to give protection against ground attack aircraft. Production *Hawks* will have a solid fuel motor containing a rapid burning, high-thrust charge for initial acceleration and a slower burning sustainer charge, both in the one chamber. The sharply swept delta wings are cast in one piece and are bolted in a cruciform configuration to the body. Trailing edge control surfaces are

*Hawk*

operated by jacks in the tail fairing. Semi-active homing is employed; the ground radar developed for *Hawk* has very high powers of discrimination in selecting echoes from a low-level moving target from a mass of static echoes from ground features. A novel trailer-launcher carries three *Hawks* which can be fired in quick succession. The *Hawk* also is to be adopted by the United States Marine Corps. The main dimensions are: length, 16 feet four inches, and span, 47 inches. Maximum velocity approaches Mach 3, and the slant range is about 15 miles. *Hawk* installations will be built on the United States eastern seaboard.

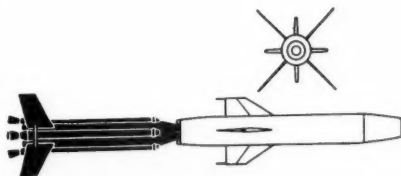
Parca (projectile autopropulsé radio-guidé contre avions) is the first of a family of surface-to-air missiles for the French Army. Its *SEPR* liquid sustainer motor

gives it great altitude capabilities (over 80,000 feet), but its velocity is too low to make it an effective missile in this day and age. Shortly to be superseded by more sophisticated weapons, *Parca* has served its purpose as an interim training type. It is similar in layout to the *Nike Ajax*, with a cruciform of sharply swept wings with

*Parca*

trailing edge control surfaces and canard foreplanes. These, however, are indexed at 45 degrees to the wings. It joins this layout with the classic British formula of four wraparound solid fuel boosters. The missile is guided by radar command. The *Parca* is 16 feet four inches long, and its maximum diameter is 18 inches. The span is 63 inches, and its firing weight is in the order of 2,200 pounds. Its range is about 21 miles.

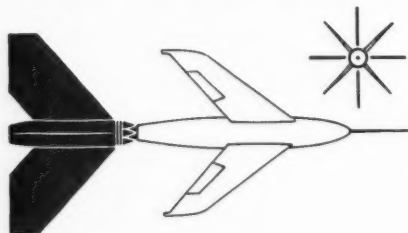
Very little is known about the *Matra M*

*Matra M 043*

043 but it is believed to be a development missile for a ship-to-air weapon for the

French Navy. It is ramjet propelled with a tandem liquid fuel booster. The missile is launched vertically and has a cruciform of tiny delta wings with squared tips, and no stabilizing surfaces. The guidance system is mounted in the center shock cone of the ramjet intake, and is probably of the command radio type.

The *SE 4300* is an interim training type weapon in limited production for the French services. The sustainer motor is a *SEPR* nitric acid/furaline unit; the large-

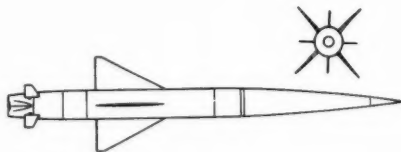


SE 4300

fin booster unit has solid propellants. The four sharply swept wings have aerodynamic control surfaces, and a span of seven feet. Guidance is by command radar. The launching weight is about 2,200 pounds, and the speed is about Mach 0.9.

The *Oerlikon Model 56* is an outstanding example of what can be achieved in the

missile field by a small country with limited resources. It is entirely a private venture of the famous Swiss armaments firm and its electronics associate, Contraves A G. The missile is a beam rider, and is propelled by a liquid rocket motor, burn-



Oerlikon Model 56

ing kerosene, with nitric acid the oxidant. The missile is launched from a stand mounting two rounds, capable of being elevated to the vertical to allow firing from the deep Swiss valleys. The delta wings move toward the nose as the center of gravity moves with the consumption of propellants. Launching weight is 820 pounds and the length is 19 feet. Maximum combat altitude is over 66,000 feet and the burn out speed about Mach 2.4. A slower, recoverable version has been developed for training purposes. The *Model 56* is used for Swiss and Swedish home defense, and is built under license in Italy. A manufacturing license has been sold to Mitsubishi Industries of Japan.

Possibilities and Will

Digested by the *MILITARY REVIEW* from a copyrighted article by Colonel Achard-James in "Revue de Défense Nationale" (France) November 1957. Translated by Mr. LaVergne Dale, Leavenworth, Kansas.

Hot war, cold war, total war, frontier war, psychological war, revolutionary war, subversive war—and without doubt there are other qualifying words applicable to conflicts.

There is no shortage of headings in the classifications of war; neither is there any

lack of fine shades of meaning between classifications. And so it is that in the end, one finds himself incapable of saying what category of war he is in or to what class of war belonged the crisis to which victory or defeat was due.

All human action implies the existence

of means permitting its realization, and of a will to put these means into action. Possibilities and will are indispensable in the least inconsequential of activities as well as in those which are of concern to the entire world.

The infant in his cradle has the possibility of putting his thumb in his mouth. His embryonic will causes him to perform this action. The two giant nations have the possibility of destroying the world with thermonuclear means. What will be their will?

With one of the terms [will and possibility] lacking, there is no longer any action. The infant, restrained by his swaddling clothes, can no longer put his thumb in his mouth. The will of the two great powers has not come into play. The world continues to live.

Will and possibilities are not without interactions. The will to attain a goal gives rise to the creation of the possibilities of attaining it, and their birth often gives rise to the will to use them. But so long as will does not have possibilities at its disposal, it is totally inoperative. It then remains dedicated to the creation of an opportunity which may require a long wait.

Quite in contrast with this, when the possibilities exist, action may be begun as soon as will appears. And will is extremely quick in appearing.

History shows examples of wars breaking out by surprise the day that will went into action, while the possibilities had required years for their proper shaping—for example, Poland in 1939 and Pearl Harbor.

Political Objectives

Without will one may, nevertheless, be impelled by an external force to take action—action that usually is passive. The accepting of subservience without reaction is the lowest ordered form of action. Will acts in this case in impelling to nonutilization of existing possibilities or of failing to create them—many cities have declared

themselves open cities in order not to be obliged to make the effort of a defense.

It is difficult to conceive a war that has no connection with political objectives. When these objectives are well-established, every resource is utilized for attaining them: economic, financial, intellectual, and diplomatic. If these means prove ineffectual, it is necessary to resort to the *ultima ratio regum*. This “boils down” to the achievement of one's objective by the suppression of the opposition.

The achievement of political objectives by armed forces is not always direct. Intermediary strategic objectives are established: territorial defense, conquest of enemy territory—which may be the political objective—or destruction of the enemy's means of resistance.

Whatever the objective, a clash with the military means and the will of the adversary and his chief are necessary.

But the decision is obtained on the lower tactical level. There we find the combatants and their individual wills face to face. It is at this level that the repercussions are the most violent. These are manifested in the form of losses, in the midst of which both possibilities and will may go down together.

This has been the case in all ages, and still is. One always has had, and one still has, the choice of breaking his adversary's resistance by attacking either his will or his capacity to react. As a matter of fact, that is precisely what has happened today, but the attention given to each of these alternatives has changed.

The Past

There was a time when the fate of states was entrusted to small armies composed of professionals, for the greater part, and quite under the control of the prince who employed them. He alone represented the will, and it was precisely because he had not wished to yield to diplomatic arguments that the war had broken out.

His army constituted his sole possibility.

His will was unshakable. To cause him to yield, the only solution was to attack the small possibilities. One, therefore, sought battle.

The will of the military leaders generally was firm, also, but that of the combatants could become vulnerable in the battle itself. The barbarian tribes went into battle covered with the skins of beasts, the men wearing ornamental headdresses designed to frighten the enemy. An agent introduced at the proper moment into the ranks of the adversary and crying "Every man for himself," could set off panic in an already shaken army—the first babblings of psychological warfare.

The destruction of material strength still was a goal. An effort was made to facilitate this by an indirect method. The army, disassociated, was encircled, for the will of the prince still existed and one wished to annihilate his possibilities.

A single battle often yielded this result. Deprived of his means of action, the prince was obliged to abandon, at least for the time being, his military objectives, if not his political aims. The strategic objective was, then, the destruction of possibilities. Action against "military" will was only a method for attaining this end.

For a long time strategy retained its preference for the destruction of means over the destruction of will. The ultimate, the real objective, continued to be the latter, of course, but as long as possibilities still existed, there were misgivings—and quite properly so.

Experience shows that as long as means remain, however small they may be, it is rare that the will to make use of them does not make its appearance.

To be sure, as we have seen, action against will often played its part. Ludendorff admitted the considerable effect of the skillful Allied psychological activity in the German defeat of 1918. There were many cases of revolts stirred up in the rear areas, of desertions brought about.

But this, although sometimes of decisive weight, was, nevertheless, not regarded as the essential decisive action.

Revised Doctrine

This doctrine remained in force until recently, even though all the factors which were to bring about its complete revision had already appeared.

First, we must consider the democratic makeup of the states—leaders are chosen by the masses. The will of the popular masses naturally is less informed in such states, hence less accurate than could be that of an absolute monarch or of a dictator. It is less firm in such states since it represents only an average, and this not necessarily of a very high order. It is rare for the elected leader not to feel himself somewhat under obligation toward his electors.

The total participation of nations in war had become indispensable and unavoidable—indispensable, in view of the effort required of belligerents in modern warfare, for everyone has something to do in connection with it; unavoidable, for the reason that enemy actions include everyone in the field of battle.

An enormous increase in possibilities results from this. Germany was a striking example of this, remaining in the lead over the entire world for five years, but also suffering from the war even in her remotest corners.

The unheard of development of psychological means of action and techniques has considerably modified the doctrine of war, as has the advent of weapons of great power of destruction. Everyone fears the employment of the atomic weapon because it is a two-edged weapon. A large-scale armed conflict would unquestionably lead to its employment.

The consequence of these facts is an increase of possibilities, rendering their total destruction slow, costly, and uncertain.

The vulnerability of will has increased in both the command and combatant

echelons. This has resulted, of course, in the development of special "possibilities" of acting on these wills. It is logical, therefore, that strategy has seen its objectives changed.

Successive Steps

The primary objective no longer is the destruction of the enemy's possibilities, but of his will. In this conquest of will there are, as in all strategic action, successive objectives—successive steps.

The first stage to be attained is unquestionably total indifference to all that is "national," to the idea of native land, and to the safeguarding of common welfare.

There is no need at all of any psychological action for attaining this stage. It suffices to leave individuals in the grip of their instincts alone. It is unnecessary to state that these are not generally of a very high character: egoism, personal interest, and continuation of existence at any cost.

A country cannot maintain its position if it contains no other than such temperaments. The first success of at least one such effort has been to give the nation attacked a veritable phobia against all propaganda—this to the point where the very individuals charged with the education of youth appeared to avoid everything that could orient the young minds in the direction of at least a minimum of patriotism. Youth, left without an ideal, is at the mercy of all propaganda.

The second step in the conquest of wills leads to refusal to carry out any measure relative to national defense.

The third leads to turning their weapons against their own generals and against governments which have remained national.

Last, and the fourth step, the ideal is to get all the possibilities of the enemy country to change camp without commotion. For this it is necessary that all the wills be won over to a complete national

abdication under cover, possibly, of an unconditional alliance or even a voluntary annexation.

Today, the technical advances of psychological action employed against democracies render this method easy to put into action with success.

This brief study is very schematic. There do not exist such clear-cut differences between the four stages of a "conquest of wills" operation. In fact, they may coexist. The various psychological groups of a population have not always attained the same degree of ripeness. There will not be any waiting until the desired result has been obtained in all of the groups before passing from one stage to the next one.

Action, taken as a whole, will be of a progressive nature. But there is one thing that is certain, and that is that action against wills must precede that against military possibilities, and the latter will be less costly and more reduced, the better the first has been conducted. If it has been perfectly successful, the second will be wholly unnecessary. The overripe fruit will fall of itself.

Psychological Action

It is to be noted, moreover, that a psychological campaign, even when conducted in utmost thoroughness, costs much less than a military operation if decreed prematurely.

If this view is admitted, it cannot be denied that any psychological action carried on against the will of another country must be regarded today as an act of aggression on the very same grounds as would be the dispatch of a commando force in peacetime against a munitions works or the destruction of a stock of military matériel.

If it is difficult to distinguish between what is subversive war and what is revolutionary war, it seems almost impossible to fix the point at which aggression against wills actually begins.

When the objective has been fixed, the more or less complete conquest of wills becomes a psychological action, carried on with all the techniques of propaganda. If circumstances require, it extends to close material and intellectual control over the masses.

The first condition for the success of given propaganda generally is a discrete start. The responsible authority of the attacked country has a tendency neither to be interested in it nor even to pay any attention to it. This authority is in danger of being outflanked quickly.

The progressive conquest of opinion is accomplished by the exploitation of ideas which are seemingly secondary or at least apparently without threat to national security. Majorities thus are built up. One fine day the antinational action of these masses becomes antigovernmental, but no longer can be considered as subversive or revolutionary—the people are sovereign, the government has remained national, and it becomes illegal.

Invasion of Ideas

In the face of the danger of this type of invisible invasion of ideas, it would be necessary, before it is too late, to determine with accuracy the material and moral conditions whose preservation is indispen-

sable to the maintenance of an independent national life—sovereignty over a territory, or intellectual position with regard to the great problems.

Having accomplished this, it would be necessary, then, to discover all psychological actions attacking these frontiers and to have the courage to declare that aggression exists.

This is no more a revolution in the art of war than the quantitative results obtaining from the increase in the range and power of ballistic weapons.

There is nothing there but the development of concepts which have long been known and utilized, a development which modifies the relationships between the battle against possibilities and the battle against wills.

This psychological battle goes beyond the normal limits of the missions of the army and its possibilities. It is the army, nevertheless, that will feel the first repercussions of a defeat in this domain.

It must be admitted, today, that hot war is not declared, if or when it is declared, until the cold war has been won.

Being offensive or defensive in psychological warfare is a governmental affair. To adopt as a principle that psychological war will not be begun until such time as hot war is declared, is to hasten to disaster.

Do We Need Fewer Soldiers?

Translated and digested by the MILITARY REVIEW from an article by Lieutenant Colonel J. Perret-Gentil in "Wehrkunde" (Germany) April 1957.

NOT long ago the United States decided to reduce the number of men serving in her armed forces. Divisions were reorganized and reduced in strength. The reduction within the division was made possible only by the introduction of an organic divisional atomic capability. The commander of a division, in spite of the reduction in strength, will have available a firepower never before possible on that level.

Other steps were taken to reduce combat units. Tasks not directly connected with the combat tasks were taken over by staff or logistical services. In addition, several levels of command were abolished. Regiments and battalions of the infantry were combined into combat groups on a regimental level. Combat groups consist of six companies—a staff company, a company with recoilless rifles, and four

combat companies, the latter better equipped than ever before.

Effect on Europe

It has become immediately essential for the more important European countries to question the value of their military organizations and the possibility of their reduction in strength by the introduction of atomic weapons. There is no question that the air forces stationed in western Europe are losing steadily in value and must be replaced by guided missiles and projectiles.

England seems to take her rearmament concepts very seriously. Not only is more attention paid to the development of missiles, but a reduction of the traditional units also is under way in order to effect a reduction in defense spending.

General Norstad, European NATO Commander, has reminded us that NATO had planned, in 1951, under "preatomic" conditions to raise the strength of the forces slowly to 90 divisions. The plans were revised in 1954 from a new point of view. One-third of the original strength was considered a minimum requirement. It is to be noted that the number of 90 divisions actually has never become a reality nor would it have been necessary. The plans for the air force, however, had been realized fully with regard to ground organization and strength.

Including the first German divisions of 1957 there are about 25 modern divisions in existence in central Europe, although they are not modern with regard to atomic equipment. The number could be doubled within three to 30 days. A Western armed force would, therefore, be an equal opponent to the spearhead of the East (20 divisions) and the followup of Russian and satellite reserves. Of course there would still be some difficulties to be overcome, for the second wave of forces could amount to about 30 divisions.

These are the facts about land defense. They show clearly how dangerous it would

be to reduce the number of active major units considerably. In mere numbers, however, a limited reduction within the infantry divisions would be possible in order to bring them to the new standard of modern United States divisions. The staff and other services vital for the functioning of a modern army would have to maintain their strength. All in all the surplus would not be of importance.

Specialization

Atomic weapons make the loose formations necessary. Only the border territory of zones of operations will remain fixed. Within continental Europe the time is past when several hundred divisions could be placed in direct opposition to each other. A rough estimate reveals that not more than 20 to 30 divisions will cover a front 450 miles long if we take it for granted that three to four divisions will cover about 60 miles. Operations will consist of a constant forming, dissolving, and reforming of concentrations. This will result in several important consequences.

The capabilities of the active forces will be a very important factor. They have some strikingly different characteristics. Their size in numbers will be relatively small compared with the mobilized millions of World War II. Units will consist almost solely of technicians, or at least of men with special technical training. To recruit these units, the skilled men of a nation will be selected according to a planned system. These actually will be industrialized troops and highly skilled workers rather than soldiers. It seems advisable and necessary, therefore, to provide for an army with at least 75 percent professional soldiers.

The active forces must be very well-trained, and these elite units will be as precious as battleships. In combat they will be used for quick and violent attacks in order to take full advantage of their combat power. In forming for deployment their movements will take place in a con-

centration area 60 miles wide, and their attack will be on a front of six or more miles. Recent maneuvers bear out the picture of troops spread out over the wide plains of an immense no man's land.

In addition, the divisions must be able to fight for long times without relief, since relief will be extremely difficult in an atomic war. This makes it necessary to organize them into four parts capable of separate employment.

Nevertheless, there will be a limit to the fighting ability and resistance of the active forces. One plan proposed has been to employ an armored and a rifle division alternatively. The armored division, after combat action, would withdraw to cover behind the infantry division.

The major units will have to reorganize after longer operations and eventually to retreat under the force of a counter-attack of equal strength. Although the active forces will have to fight independently in a great combat area in order to avoid concentrations, they will be unable to fight for too long a time without backup forces or previously prepared positions.

A Second Echelon

This leads us to another important conclusion. Modern warfare demands a second echelonment of forces behind the active forward forces. This second echelon need not necessarily be of the same strength and quality as the first. It will reinforce the operating forces considerably, but the nature of its task will be static. This force will build so-called "support positions"; reinforced all-round protected zones in dense forests, behind wide rivers, or on both sides of an expected area of penetration.

Another task will be the protection of the numerous, widely dispersed services, units, and installations in the areas behind the forward forces, as well as the protection of countless airbases, missile installations, and communications to the rear. Of course, it will be necessary to

change the location of these zones continually in order to avoid making targets for the atomic fire of the enemy.

Forces of the support zone must be able to accomplish more than limited missions, although they will not possess the same equipment and mobility as the professional frontline forces. The supporting units are composed of draftees and trained reserves.

It should be noted that there always has been a difference between shock troops and ordinary soldiers. At present this principle is becoming even more obvious.

Interior Forces

Even a third echelon of deep reserve forces would appear to be necessary. New weapons, supersonic planes, and guided missiles have caused an obvious shrinking of the European theater, which is only the border area of the main continental area as seen from the periphery.

Another new element still growing in importance is presented by the airborne units. Some of these are completely reorganized, equipped with their own means of air transport, and able to fulfill independent missions of considerable range. Such units (the new type of American airborne division is even equipped with atomic weapons) are able to operate at long distances as advanced guards or to support the land forces.

Partisan warfare on a scientific basis and directed from remote headquarters also may cause grave dangers. England sees her bases and worldwide communications open to systematic destruction. France has to leave several hundred thousand men in Africa.

Numerous factors, most of them new, make it necessary to keep strong forces in the rear. Their task is not limited to preserving order, for sometimes they may have to engage in actual combat operations.

Forces with a task range limited to the rear always have been in existence. Now,

however, they acquire new importance. In other words, it appears that the deliberate dispersion at the front is equalled by a mathematically increased density of formation toward the central parts of the country. It is necessary to think more seriously of the defense of the central interior of the country. Even distant America hardly will be able to evade this requirement.

In this light it is difficult to comprehend how a reduction of the troops at the front should result in the release from service of additional personnel. On the contrary, the only difference will be in the concentration moving toward the central parts of the country. There will be less front and combat troops but more supporting forces for home defense. The latter will have to be trained combat units, too, of course.

Air Forces

The air forces already have undergone a different but parallel development. Airbases have moved farther and farther back. The same thing is happening with the bases for the launching of missiles. Since it is not possible to spread them out farther in the frontline, they have to echelon in depth. The air force stationed in Europe will likely soon reach its limit in fighter defense because of the increasing speeds of jet aircraft. The same development may be observed in the field of guided missiles and rockets with traditional or nuclear warheads. Any area that is too limited on the sides must be expanded in depth or height, as if we had here the effects of a law of physics.

However, there is no doubt that the continued development of missiles of medium- and long-range as an attack or anti-aircraft weapon will permit a considerable reduction in personnel. The use of atomic explosives also will reduce the number of bombers needed, according to previous norms. The introduction of atomic armament, however, made a wide dispersion of bases and atomic depots necessary. A con-

sequence is an increase in lower command echelons and in communication services. All this demands a considerable increase in personnel. It will be difficult to believe that what was saved by the reduction would not be employed in other positions.

In general, it is accepted that the introduction of new weapons will result in a reduction of the combat forces. This also will lead, however, to an increased demand for personnel in the rear, not only in the production centers but also in their protection. The technical training of personnel needs constant improvement, resulting in the creation of new positions for training and teaching personnel.

The Soviets

The above development of the West has found a parallel development in Russia. But Russia tried to use the entire development for propaganda in announcing the reduction of her forces, missing the actual meaning of it. Since World War II, the forces of Russia on the Western Front have undergone a constant change and improvement with regard to shock troops and in the fields of mechanization and mobilization, but not as yet on the field of atomic weapons on division level, where the American forces are leading.

Even if conducted in different ways—through reduction on the American side, and through additions on the Russian side—we now have divisions on both sides of about the same number of men.

Taking a closer look at the more numerous Russian forces, however, we find stronger reserves for the operating forces. The forces of the satellites probably will be used to occupy the support zones, for they are much less well-equipped and do not have the operational ability of the Russian troops.

The reduction of the Russian forces did not apply to the special weapons of the air force and the navy, but new concepts of strategic concentration have made the reduction of the land forces possible.

Another aspect of this development seems to have been overlooked. Marshal Zhukov has announced that all eligible Russian citizens who had not been drafted would undergo a complete military training in the youth movement of the system. These personnel will take over the ground defense of the immense Slavic territory. It was stated clearly that they will serve in the anti-aircraft defense, the defense against airborne attacks, the protection of the great population centers, and preventive and protective measures after atomic attacks. In view of the extensive Russian territory this will require a force of several million men. Here again we will come to the conclusion that a reduction in number of personnel in the land forces increases the necessity for a home defense force that more than makes up for the former reduction.

The changes in manpower resulting in a reduction of the operational forces and in the increase of the home defense forces may, therefore, be observed in Russia as well as in the United States. New conditions of modern warfare have created new but not decreased demands for personnel.

Conclusions

Three main elements of national defense can be observed:

1. Operating forces for land combat, equipped with the newest weapons and

consisting mostly of professional soldiers with high technical qualifications. The air force and navy will show the same characteristics, no matter how they are organized.

2. Supporting forces consisting of regular divisions as well as of top-quality reserve divisions representing a powerful second echelon, and acting as an intermediate between the field forces and the home territory. They serve as reinforcement for the operating forces and may be employed in the offensive and the defensive as well as serve for the canalization and repulsion of attacking enemy forces.

3. Stationary home defense for the protection of the rear areas, the population centers, industrial areas, and foreign possessions. Even though consisting only of reserve forces, this element must be well-trained and equipped for local combat and partisan warfare within limited areas.

There have been differences in these forces at all times. The only thing new is the growing importance of the difference between them. The characteristic is a reversed pyramid of forces, the base of which was formerly the combat front. Today, the peak is at the front. It may be called the "spearhead" or "battle corps." All in all these frontline forces seem to need less manpower. All three elements together, however, will still require the same number of men.

Our Pentomic Airborne and Infantry Divisions have impressive mobility. They could be moved by strategic airlift, if necessary, across oceans and continents to any threatened area. By means of assault transport planes, infantrymen now have tactical battlefield mobility comparable to paratroops dropping out of the skies upon enemy-controlled territory. Increased emphasis upon helicopters and other light air vehicles as organic division equipment is solving difficult problems of observation and fire control, the command and supply of widely dispersed units, and the rapid movement of small bodies of combat troops over even the most difficult terrain.

Secretary of the Army Wilber M. Brucker

The Age of Nuclear Gunners

Digested by the MILITARY REVIEW from an article by Colonel
A. J. B. Bailey in the "Canadian Army Journal" July 1957.

YEARS ago an obscure artilleryman decided that the solid iron shot which his bombard propelled was rather an ineffective weapon. One either hit the target or one did not—and a miss was as good as a mile! Why not, he pondered, fill the shot with gunpowder which, with the aid of a short fuze, would explode at the target? In this way, he reasoned, fragments of iron would cause casualties and damage even if the shot did not actually strike the target.

Once this artilleryman had processed his idea through various committees, modern ammunition was born. For several centuries, however, little real progress in ammunition design was made beyond this point. Fuzes were improved, bombs were streamlined into shells, and greater ranges and accuracy were achieved, but the basic idea remained; a filling of high explosive detonated on the target causing casualties and damage with fragments of steel.

Now we are entering upon a new ammunition era; and the change to nuclear ammunition is just as significant today as was that change, hundreds of years ago, from solid shot to the shot that was filled with gunpowder.

Actually, nuclear ammunition has many of the characteristics of high-explosive ammunition, but it differs out of all proportion in its effect at the target. It kills by blast, radiation, and heat; it can contaminate ground with radioactive particles; and its power is so great that one comparatively small round is equal in effect to thousands of rounds of ordinary high explosive. It is the very power of this weapon that makes it mandatory for all those who are concerned with its employment to know a good deal about it.

The nuclear warhead has not replaced the conventional high-explosive warhead. The latter, delivered by guns and howitzers, is still required to provide that essential close neutralizing fire which enables the infantry to capture ground, and to hold the ground they have captured. Nuclear warheads and the systems which deliver them cannot provide the sustained fire of small conventional shells; this is so today, and it is likely to be so for a great many years.

However, the nuclear warhead has, by its very power, reduced considerably the requirement for massing large amounts of heavy artillery. Instead of the hundreds of guns which provided firepower in the great battles of past wars, one or two delivery systems with nuclear warheads will suffice now. This has an added advantage because the elimination of massed guns is forced upon us anyway. In this nuclear age it would be unwise to present such an attractive nuclear target to the enemy.

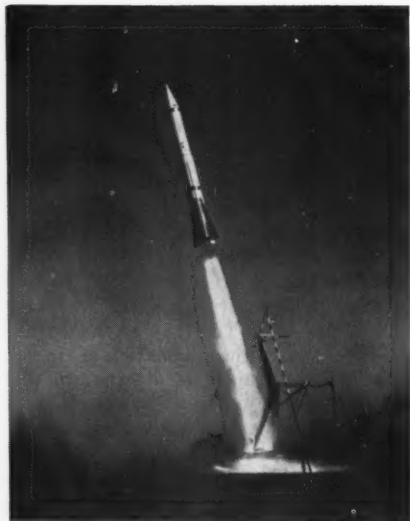
At this point one is assuming that all future wars will be nuclear wars. This may not be a valid assumption, particularly in respect to limited periphery wars or police actions where the powers concerned decide that the risk of all-out nuclear war is too great. However, it would be imprudent not to bargain for the worst case, that is, wars in which nuclear weapons are employed. Having bargained for the worst, the plan must be sufficiently flexible to be capable of adjustment for those wars in which nuclear weapons are not employed.

It is important to realize that the weapon of artillery is its warhead—whether it is a shell or a missile. The delivery system (gun, howitzer, rocket,

or guided missile) merely ensures that the warhead is delivered to the required place at the right time.

Cost

One fact which has not been made clear and which has a definite bearing upon the selection of a family of delivery systems, is the relative cost of delivering a shell or a missile. A gun or howitzer is expensive to develop and to produce



United States Army *Sergeant* surface-to-surface guided missile

but, once produced, will deliver thousands of relatively cheap shells, reliably and accurately. On the other hand, although a free flight rocket assembly and launcher system is fairly cheap to produce and is durable, the rocket it delivers costs considerably more than a shell. A true guided missile system is extremely expensive, both in its ground-based electronic apparatus and in its complicated missile.

Therefore, it may be argued that within a given range, a gun or a howitzer may be the most economical system with which to

deliver a nuclear warhead. There is a limit in maximum range, however, beyond which it is impracticable due to weight and immobility to develop a gun for field use. Beyond this maximum range, a guided missile provides the only solution. Thus if long ranges are required, and all evidence points increasingly toward this requirement, the guided missile must be employed no matter what the cost of the system.

At the moment the choice of nuclear delivery systems to complete the surface-to-surface family is somewhat limited because only a few operational guns, rockets, and guided missiles are capable of carrying a nuclear warhead. Progress is being made, however, and, within the next few years, it is conceivable that a wider range of delivery systems, capable of carrying a nuclear warhead, will have been developed.

Availability

Having selected a family of nuclear delivery systems from those which are available now, and from those which show every indication of being available within the next few years, one must turn to the warheads they deliver. It has been said that soon, if not already, a state of "nuclear plenty" will exist, that is, as many nuclear warheads as are required will be available. However, even if this stockpile is available, some authorities feel that tactical nuclear warheads will be employed with considerable caution in the war of the future.

The proponents of the cautious employment of tactical nuclear warheads base their argument on the terrific power of the nuclear explosion and on its subsequent devastating effects. They reason that one can equate the killing power of one nominal nuclear warhead to the killing power of a large battle group of all arms; and, consequently, that the warhead should be employed with similar planning, preparation, and caution to that

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which is necessary before committing a large battle group. If one accepts this theory and if, for the sake of argument, one equates the killing power of a nominal 20-kiloton warhead to an armored brigade group, it follows that the allotment of 20-kiloton warheads to a formation the size of a division would be somewhat restricted; a "normal" allotment might be on the same basis as the allotment of armored brigade groups, that is, one 20-kiloton warhead for a divisional battle.

Other factors which also may restrict the allotment of nuclear warheads are that they are constructed of very critical materials, of which there will never be an overabundance, and that they require a huge and very expensive production effort, particularly in the smaller yields. Then, of course, there is the probability that multiple nuclear explosions would saturate the atmosphere with radioactive particles—a situation which might be as disastrous for friendly forces as for the enemy, depending upon the direction of the wind. This factor alone may necessitate severe restrictions upon the use of nuclear warheads to the extent of allowing, perhaps, only one nuclear explosion per corps front per day, or something on that order.

Characteristics

The nuclear explosion differs from the ordinary high explosive in four basic characteristics:

1. It produces powerful blast waves of relatively long duration.
2. Temperatures in the order of millions of degrees are recorded.
3. It emits penetrating rays which can damage the human body.
4. It causes contamination by radioactive materials (fallout).

The nuclear warhead can be detonated as an air burst, or a surface burst, or a subsurface burst, depending on the effect desired upon the target. From the

information available now it seems that it will be more usual to employ air bursts to achieve tactical nuclear firepower. Surface and subsurface bursts result in severe contamination of the immediate area and are, therefore, only suitable for employment in front of friendly forces when there is no intention of traversing that area in the immediate future.

Nuclear warheads are classified by the yield each develops. This yield is stated in terms of an equivalent weight of high explosive, that is, the "nominal" warhead which was dropped on Nagasaki is known to have been equivalent to 20,000 tons of high explosive (20-kilotons). The actual yields of tactical nuclear warheads which are available at present is highly classified information, but one can assume that the range extends from about one-kiloton to 50-kilotons, and that warheads within this range can be delivered by the systems now extant.

Targets

The selection of the correct yield for a nuclear warhead is one of the most important operations in the entire chain of events but, before this can be done, a suitable target for nuclear attack must be found and fixed. With present equipment this is a most difficult task.

Heretofore it has been comparatively simple to find and fix targets for relatively short-range conventional guns and howitzers by utilizing ground and air observation posts and by reconnaissance aircraft. Survey has been extended, and targets and delivery systems have been imposed on a common survey grid, thus facilitating the computation of target data. Now, however, the increased maximum ranges of the delivery systems and the huge potential of one nuclear warhead have added a new significance to reconnaissance and intelligence. In order that a commander may know when a suitable nuclear target has been found and accurately located, a

number of important requirements must be met.

Some of these requirements are:

1. A reliable system of visual, photo, and electronic means of air reconnaissance.

2. A system of rapid evaluation and assessment of all information received.

3. The employment in the forward areas of every available means of ground reconnaissance, supplemented by light aircraft.

4. Friendly forces must be thoroughly aware of the importance of recognizing and passing back any information which may assist in the assessment and evaluation of possible targets.

5. Increased patrol activity to provide continuous coverage.

6. Trained reconnaissance troops to fight for information.

7. Continuous contact with the enemy.

8. Efficient intelligence resources to reduce to an absolute minimum the time required to secure, report, interpret, evaluate, and disseminate information.

In addition to the above, the intentions of the enemy regarding the use of nuclear weapons must be detected to enable friendly forces to take timely protective action. Special emphasis also should be placed on concealing our own activities and on neutralizing or destroying the effectiveness of enemy intelligence.

These requirements indicate how difficult it will be to find and fix suitable nuclear targets, especially when one appreciates that even a warhead of the smallest known yield cannot be employed in close proximity to friendly forces. This raises a major point: What is a suitable nuclear target?

Selection of Targets

If one accepts that the allotment of tactical nuclear warheads will be somewhat restricted, it would seem that it will not be feasible to employ nuclear

warheads against "suspected" enemy positions or in "random" harassing fire. It will be profitable only to engage those targets which warrant such killing power; and, of course, the decision must be based upon the tactical significance of the target.

If one battalion battle group, on key ground, was holding up an attack and could not be bypassed, this target might warrant a nuclear warhead. But would not a small warhead, a two-kiloton equivalent to 2,000 tons of high explosive, overkill this target? Again, remembering the pictures of devastation at Nagasaki with a nominal 20-kiloton warhead, against what kind of targets could this power be used without overkilling?

The answer to this problem is not easy but it seems again that we should err on the side of caution and ensure that only those targets are engaged which really merit the terrific killing power of the nuclear warhead. This may be forced upon us anyway because of the restrictions in the allotment of nuclear warheads which are likely to be imposed.

Target Analysis

Once a likely target has been found, the matter of target analysis arises. Target analysis can be defined as the process of "tailoring" a specific yield warhead to a specific target. In effect, the target analyst makes an estimate in which he analyzes and compares his own courses of action (attack capabilities) against the enemy's capability (the target) to accomplish his mission (the purpose of the nuclear attack).

The analyst is endeavoring to determine such things as the best yield and the delivery system to use; an estimate of the results in terms of personnel casualties and material damage; the probability of achieving these calculated results; the point of aim, height, and time of burst; and the safety precautions for friendly forces.

The most difficult operation in analyzing a nuclear target is describing the damage to be expected. This is due to a lack of detailed knowledge of the target and to the fact that damage is not absolute, but can cover a wide range. In order to "tailor" a specific yield warhead to a particular target the analyst must know the nature and the size of the target, and the damage criteria in blast, thermal and/or nuclear radiation that will cause the required damage to material or personnel.

Weather

Prior to the release of any nuclear explosion the provision of an accurate meteorological forecast of weather conditions which will prevail at the time of the explosion is essential. The safety of friendly forces is of prime importance when planning the use of nuclear weapons. An adverse wind condition (a wind blowing toward friendly forces) at the time of the explosion could negate any advantage gained from other effects of the nuclear weapon. The analyst also is extremely interested in the forecast of atmospheric conditions, that is, the extent of fog, rain, cloud, and visibility. Variances in these conditions will affect the results obtainable for any particular yield.

In some parts of the world it may be relatively easy to produce an accurate forecast, but in other locations normal conditions may not be too well-known and the production of a forecast with the required accuracy may be very difficult.

The forecaster or meteorologist must be able to determine wind speeds and direction at many heights up to a considerable altitude in order that the "fallout" pattern may be predicted. Even when the information is obtained, it is stale to a degree and may change considerably by the time the planned nuclear explosion occurs. A commander must be prepared to alter his plan quickly if weather conditions change just prior to the release

of a nuclear weapon. This may have the effect of canceling or postponing the operation if complete reliance has been placed in the nuclear portion of the fire plan.

Level of Control

Before deploying the delivery systems and preparing the shells or missiles and before finding, fixing, and analyzing a target, a decision should have been made on the level and method of control of nuclear warheads. This problem is far from being solved. At one extreme there are those who advocate control at the top, that is, the Joint Operations Center, on the basis that no nuclear warhead should be exploded unless the top commander has agreed that a suitable nuclear target exists and that all friendly ground and air personnel have been warned.

The opposite view is that divisional or even brigade commanders are the people who have the "feel" of the battle and, therefore, only they can decide where and when a nuclear warhead is required. These see the control of nuclear warheads delegated to divisions and, on occasions, to brigades.

The answer probably lies in a compromise. The main point is that the general principles which govern our present system of control of nonnuclear firepower should also apply to nuclear firepower. On one hand, control should be centralized at as high a level as possible to achieve concentration, coordination, and economy of effort. On the other hand, the formation which has primary responsibility for the conduct of the operation should have direct control of a proportion of the firepower resources.

The army or corps commander, who has been allocated nuclear weapons and authorized to employ them, would presumably make any necessary decisions regarding their use. Any tactical commander may request nuclear fire providing a suitable target has been identified

or providing his task will be assisted materially by such firepower.

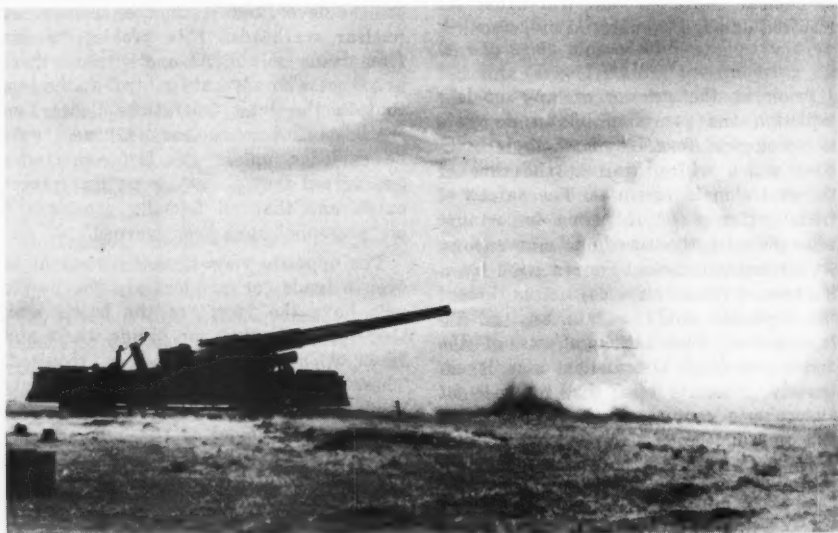
Factors of Control

Supply and the extent of target information from reconnaissance and intelligence agencies will govern, to a great extent, any decision for the use of nuclear warheads. The level at which tactical nuclear warheads will be controlled

its proximity to friendly forces, its composition, and the speed with which it must be engaged.

8. The coordination required between formations and with other services, such as the air force.

The above points indicate that any decision regarding the level of control is not an easy one. At present, due to the characteristics of current delivery sys-



Within its range, an atomic cannon presents the most economical system with which to deliver a nuclear weapon. Above is the United States 280-mm gun.

can only be determined after considering such factors as:

1. The tactical concept.
2. The area of responsibility of a commander in relation to the warhead yield.
3. The range, accuracy, and time required to fire the delivery systems available.
4. The degree of urgency in engaging the target.
5. The availability of both nuclear warheads and delivery systems.
6. The access to target information.
7. The nature of the target including

tems, it appears that the firing of nuclear warheads against most types of targets must be coordinated at the highest level (Army and Joint Operations Center). Corps normally will be the lowest level at which command and control of army nuclear delivery systems will be exercised. As new and improved delivery systems become available this concept may be relaxed considerably.

Coordination

One point that is clear, however, is that coordination is essential in order

that adequate warning is provided for friendly ground and air forces. The protection and safety of friendly troops is of paramount importance.

Training

One extremely important aspect of the entire nuclear problem which must be mentioned is that of training. The theory of nuclear warfare can be learned by the attendance of officers and men at courses of instruction and in unit training, but how will it be possible to undertake realistic practical training?

Early in the Second World War we realized that combined-arms training with live ammunition was essential in order for the infantry to become familiar with artillery firing over their heads and in close support. This training became so realistic and was considered so important that often minor casualties resulted from soldiers getting too close to their own artillery fire. This training paid handsome dividends in battle and has been continued as an essential part of collective training ever since.

If we are to capitalize on past experience, we should soon begin similar realistic training with nuclear warheads. Nuclear simulators and dummy delivery systems can be used, but nothing will equal training for battle with the actual warhead. The problems are, of course, the terrific expense of the delivery systems, the missiles, and the warheads themselves; and the selection of an area wherein the explosion of nuclear warheads would be permitted. Even in our vast country [Canada] we do not seem to have an area similar to Las Vegas where the United States conducts her nuclear tests. The training problem requires immediate and prolonged study and a sound solution if our forces are to be ready when a nuclear war occurs.

These, then, are some of the problems of the employment of nuclear warheads. There are others, some of which have not been discovered yet, but it has at least been indicated that nuclear war will not be any easy one.

Tactics

One aspect which has been stressed continuously is that the nuclear warhead is an expensive killer in relatively short supply and one cannot treat it like an artillery shell, tossing it around at suspected targets with gay abandon. In fact, the nuclear warhead and its delivery system have become so important and have such an effect upon the outcome of the battle that future army tactics will inevitably change. In the end, they may be very similar to naval and air tactics of the past.

When the big battleship carried the "Sunday Punch" the little ships and the fleet air arm ran interference for it, finding the enemy, pinning him down, and leading him into a position where the battleship could deliver the victory blow.

Similarly, in the air force, the fighters provided the escort so that the heavy bomber could orbit over the target and deliver its 1,000-pounder. It will be the same for the army in the war of the future.

The infantry, armor, and conventional artillery battle team will provide close protection for the nuclear delivery system and its warheads and will seek out the enemy and lead him or drive him into the nuclear killing grounds. The artillerymen, with their nuclear weapons, thus become the basic fighting arm of the future army and the foundation of its tactical structure.

Verily, the age of nuclear gunners has arrived.

BOOKS OF INTEREST TO THE MILITARY READER

WAR—1974. By Lieutenant Colonel Robert B. Rigg. *United States Army*. 304 Pages. The Military Service Publishing Co., Harrisburg, Pa. \$5.00.

BY COL HEWITT D. ADAMS, *USMC*

The author has taken present-day weapons and vehicles plus some on the drawing board and has projected their development and use some 16 years into the future. Approximately one-third of this book is devoted to a discussion of "hardware" and its impact on future warfare—a justification of the basis for the story which preceded.

The story itself primarily is concerned with the fighting of a general war in 1974—a war which is won by men using the new machines with imagination and courage. Unfortunately, the men in the story do not come alive. Their conversations are stilted, and no attempt is made to develop characters.

Panic looms large in the telling of the story. Both civilian and military know it. If this represents a true evaluation of the state of affairs to come, it is a serious indictment of the ability of nations to educate their people to the realities of modern technology. No discussion of this need is made, unless the book as a whole could be considered such a discussion.

No one can quarrel with the author's vision. None of us can foresee with clarity the nature of future warfare. I could only have wished that the story had been presented in a more readable and interesting form.

THE ATOMIC AGE AND OUR BIOLOGICAL FUTURE. By H. V. Brøndsted. Translated by E. M. Huggard. 80 Pages. The Philosophical Library, Inc., New York. \$2.75.

BY LT COL GEORGE D. CARNAHAN, *OrdC*

In this book, Dr. Brøndsted, Professor of Zoology at the University of Copenhagen since 1948, describes with a minimum of technical language the biological and genetic effects of ionizing radiation. This considered presentation of the facts concerning the effects of radiation on man's genetical constitution brings to the fore problems having an ethical and social, as well as a biological, impact. The author has shown that it is the responsibility of all of us to ensure not only that our children and their descendants enjoy the material benefits of the atomic age, but that their inherited constitution is sufficiently unimpaired for them to do so.

On the optimistic side the author says that if the majority of people become convinced that caution is required in handling the problem of radiation, then public opinion on the matter will be aroused, which is essential as a guarantee of continual caution.

If this comes about—but it will require constant vigilance to achieve such a result—we may welcome the atomic age, profoundly rejoicing in the thought that by virtue of our intelligence and industry we have created the means whereby we and our descendants for many generations can 'subdue' the earth; this indeed is an absolutely necessary condition for the continued existence of the human race.

PORK CHOP HILL. By S. L. A. Marshall. 315 Pages. William Morrow & Co., New York. \$5.00.

By LT COL RODGER R. BANKSON, *Inf*

To anyone interested in fighting and the men who do it, "Slam" Marshall is well-known and highly respected as a man of courage and integrity, a consummate story teller, and a fine reporter.

The major portion of the book is devoted to a single engagement: the won-lost battle of Pork Chop Hill—won by the troops and lost to the sight of the public because of the concurrent emphasis on the exchange of sick and injured prisoners of war at Panmunjom some 70 miles away. The story of the 7th Infantry Division at Pork Chop Hill during a 48-hour slice of three days in April 1953 traces the record of the various companies engaged in the defense of the hill and tells what led up to the battle and what came after.

Slam Marshall is a Brigadier General, *USAR*, with an abiding interest and a deep faith in the US soldier. He always has focused a major share of his attention on the line soldier and his squad, platoon, and company.

If a more complete and more accurate record of a particular action exists, it probably is in one of the other books by this author who first developed the detailed interview method of reconstructing confused combat actions while they still were fresh in the minds of the participants.

The last third of the book is devoted to six patrol actions. Here, again, Marshall utilizes the same method of careful, exhausting interview immediately after the particular action, with the difference that in the case of these six actions the research is focused on a finite objective: find the weaknesses in the old "hit-and-miss" system of patrol reporting and develop a system which would be uniform and could be centrally controlled. For many

an old hand the six night patrol actions covered in this section will most vividly recall the real smell, sound, and feel of the personal war of close-quarter engagement.

ROCKETS, MISSILES, AND SPACE TRAVEL. By Willy Ley. 528 Pages. The Viking Press, New York. \$6.75.

By MAJ PATRICK W. POWERS, *Arty*

History fails to record accurately which came first: the rocket or dreams of space travel? However, Willy Ley ably links the two as he shows that "the story of the rocket is part and parcel of the story of . . . space travel." His narrative searches history for the beginnings of ideas on the subject and traces the faltering evolution of the rocket up through the great surge of scientific development in the last 30 years.

This book is one of the classics on rocketry. Since Ley is among the German pioneers of the modern rocket, he writes with authority in a rich, fascinating style. Certainly, the foundations of our rocket, missile, and satellite accomplishments of today were established by such men as Goddard, Oberth, and Von Braun—and their work is meticulously documented.

Of particular value to the military layman are the discussions of the principles of propulsion, aerodynamics, and satellite theory, all clearly explained and well-diagramed. Interesting facts are uncovered in the description of a 1906 rocket for military photographic purposes and the successes and failures of the German military missiles. From these an observer can see history repeating itself in today's newspaper headlines. Perhaps the only gaps that remain to be filled are a more thorough coverage of contemporary guided missiles and a recognition of the role of guidance principles and systems. Nevertheless, this book on rocketry and space travel is one of the most outstanding and complete for the military library.

THE RISE OF KHRUSHCHEV. By Myron Rush. 116 Pages. Public Affairs Press, Washington, D. C. \$3.25.

By LT COL HOWARD L. FELCHLIN, *Inf*

Since the death of Stalin in March 1953, the quest for absolute power in the Kremlin hierarchy has proceeded at a relentless pace. For a brief period the cult of "collective leadership" was assiduously propagated as the directing force in the Soviet Union, but even then a bitter struggle was underway for Stalin's "mantle" and dictatorial control over Communist Party and Soviet governmental apparatus.

In his brief, informative book Dr. Rush has presented a well-documented account of the methods and means used by Khrushchev to attain his current position of "number one man" in the Soviet regime. By a detailed examination of pertinent source materials—mostly of Soviet origin—he concludes that Khrushchev's rise to power followed three basic steps: control of the Communist Party administrative apparatus; election of his adherents to key positions in the Central Committee and Presidium of the Communist Party; and elimination of rivals who endangered his bid for the role of Stalin's successor.

As an anticlimax we have seen recently where Khrushchev has completed his "conquest" by deposing Bulganin and assuming the dual position of general secretary of the Central Committee, Communist Party, and Premier of the Soviet Union.

But times have changed since the era of the thirties and Khrushchev is not Stalin.

To a limited extent, Dr. Rush has over-documented his case in his zeal to examine minute bits of evidence whose relevancy at times seems somewhat obscure. But he is a diligent researcher who has contributed much to our general knowledge of the inner workings of Soviet bureaucracy. His book is worthwhile reading both as a record of the past and guide to the future of leadership in the Kremlin.

THE CONFEDERATE READER. Edited By Richard B. Harwell. 389 Pages. Longmans, Green, & Co., Inc., New York. \$7.50.

By LT COL MARK H. TERREL, *Inf*

This is one of those books that you would not buy for yourself but would enjoy receiving as a gift. You don't need it in your library, but if you drew it from the public library or found it under the Christmas tree, you would very likely read it all the way through, especially if you have the usual American interest in minutia of the Civil War.

Mr. Harwell has searched through many documents and records originating in the Confederacy. From these he has extracted a collection of excerpts, letters, and essays by people who were, for the most part, not writing for publication. He has deliberately collected items which present the contemporary Confederate reasoning, rationalization, or justification for the events described.

The book is Confederate propaganda—written for that purpose, blatant and undisguised, defined as such, suffering no dilution of purpose in editing. If your sympathies are southern, you will find confirmation of the righteousness and misunderstood valor of the old cause. If you are Yankee by trade, you will recognize balderdash for home consumption when you see it. Either way you will find the material interesting and unusual in slant. It is what might be defined as unconscious psywar material.

Its outstanding characteristic is the relaxed, expressive use of the English language as it must have originally been designed to be used. Words, suh, were words in those days, and people said them to communicate in relaxed dignity.

It is worth your time to read the book just to see the way grandpappy could write when he set out to describe something. It won't reduce to IBM cards but it is a fine rolling way to say things.

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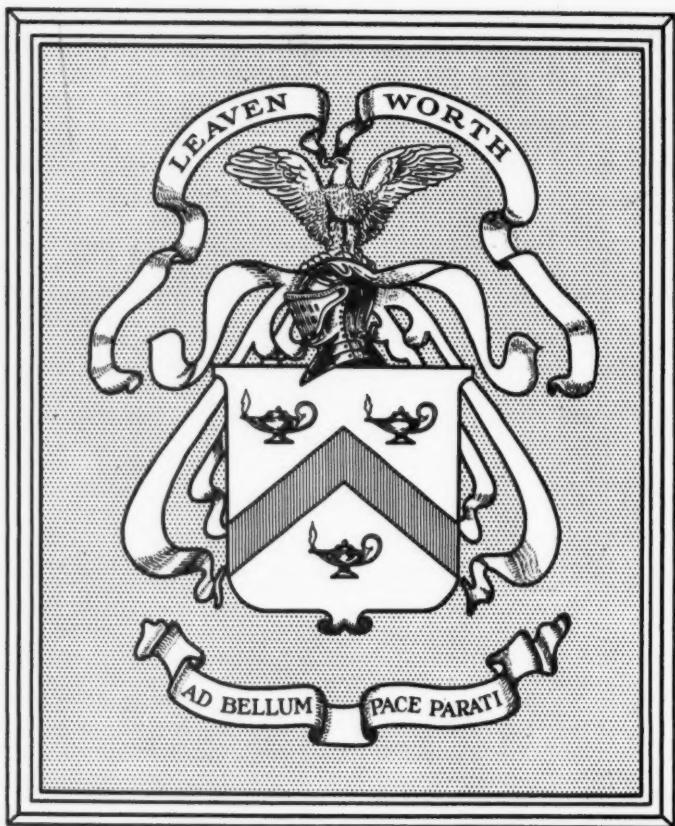
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